

AUTOMOTIVE INDUSTRIES

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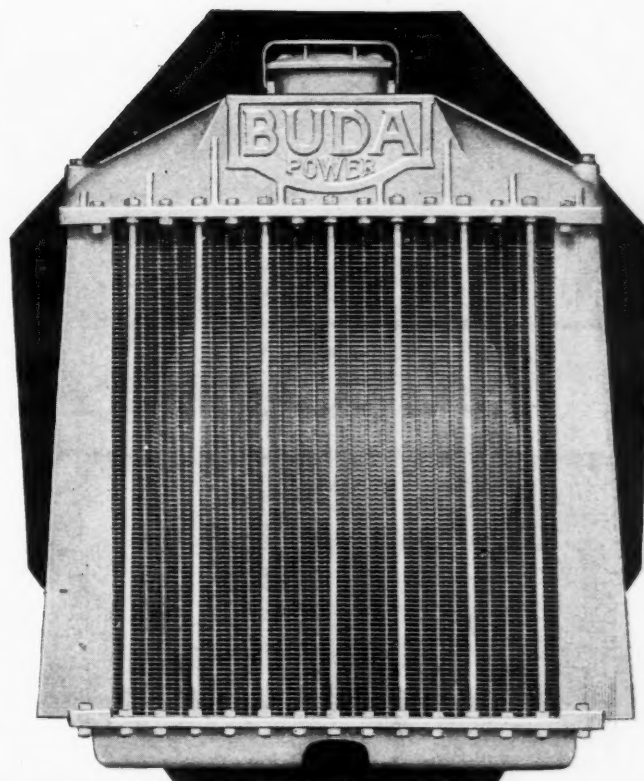
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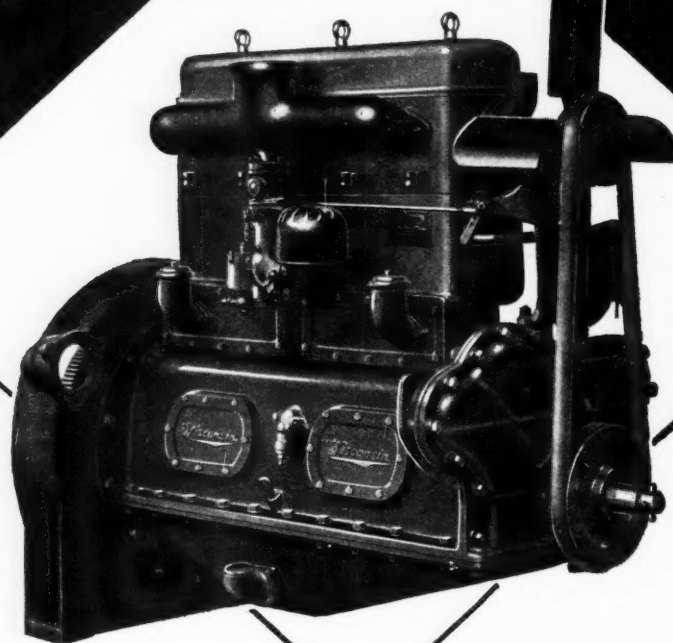
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1929
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AUTOMOTIVE INDUSTRIES

VOLUME 59

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NUMBER 23

Tractor Industry is *Completing* *Record-Breaking Year*

Production gain of 10 to 20 per cent over 1927 indicated.

*Manufacturers unanimous in belief that business will
be even better in 1929. Ford movements watched.*

By R. L. Cusick

R EPORTS gathered from many sources indicate that 1928 has been as much of a record-breaker for tractor manufacturers as for passenger car and truck builders. When the final figures are in, tractor production, it is predicted, will show an increase over 1927 of anywhere from 10 to 20 per cent, and in some individual cases the gain has been much higher.

Tractor exports during the year have increased along with domestic sales; many manufacturers have found it necessary to enlarge plants and marketing organizations to keep step with the growing demand; quite a few new models have been developed; old models have been improved, and the industry in general appears to be going forward with greater vitality and brighter prospects than ever before.

Ford's inactivity as a manufacturer in this field during the last year has of course been a factor in the increased prosperity of other companies in the industry, but perhaps not to the extent that one might suppose. For while Ford was out of production, he was very much in the picture as far as sales were concerned during the greater part of the year. It is estimated that he had from 30,000 to 35,000 Fordsons in

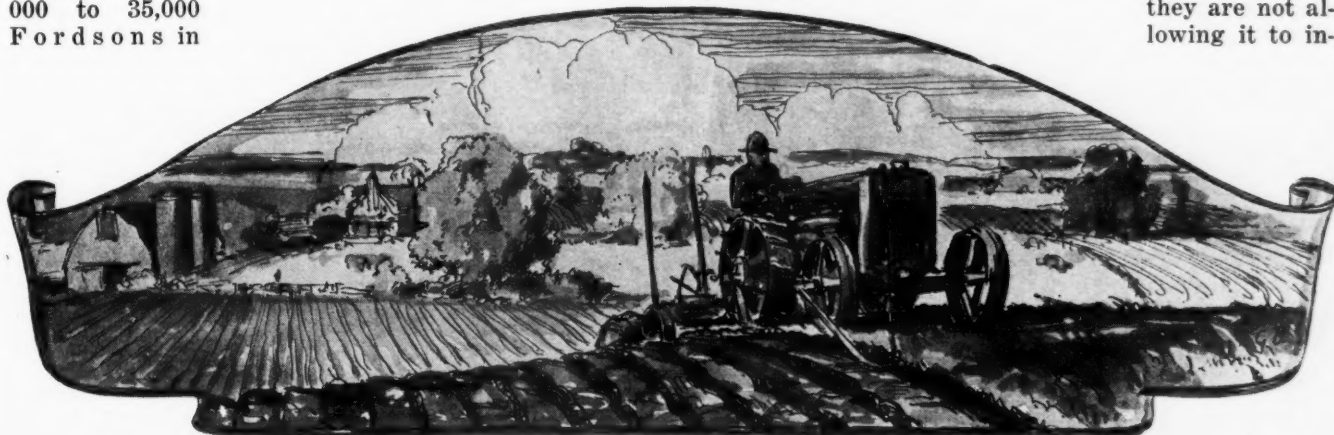
stock when he ceased production in the fall of 1927, and practically all of these were sold during 1928.

With Ford out of production, but still contributing so heavily to total sales from the stock he carried over, the fact that the total output of the remainder of the industry exceeded the total output (Ford included) for 1927 becomes all the more significant and seems to bear out the contention that the tractor is just beginning to assume its proper place in the automotive sun.

Ford is Uncertain Element

The greatest element of uncertainty in the industry as 1929 approaches is to what extent Ford will rule in the American market in future with his made-in-Cork Fordson. Does he plan to import his Cork product into the United States and Canada in such numbers as to hold the place that has been his in this field for so many years, or will he leave the American market to the other American manufacturers and confine his sales efforts to foreign countries?

His competitors are watching anxiously for an answer to this question, realizing that it is of great importance to them, but they are not allowing it to in-



terfere with their plans for increasing facilities to handle a larger volume of business next year. They believe that they can continue to prosper and expand through the normal growth of the tractor market, even though Ford should still take his customary "cut" of the total sales.

A company that has been one of Ford's chief competitors produced over 30 per cent more tractors this year than in 1927, and this production gain was being made while the 30,000 or more Fordsons which had been carried over were being sold. In preparation for 1929, this company is now building at the rate of 375 tractors a day, which is about equal to the best production ever attained by Ford.

Another strong company reports that its domestic business this year has exceeded that of 1927 by 110 per cent and that the gain in export sales has been 370 per cent. It further reports that "The business prospects for 1929 are noticeably bright, not only for the farm tractor but also for the crawler type tractor in industrial and logging work. Our increase in manufacture of tractor units in 1929 over 1928 will be approximately 300 per cent on first material purchased, with the probability of an increase over this the latter part of the year."

An accompanying table gives what is perhaps as good a cross section view of the tractor industry at the present time as can be obtained. It is based on information furnished by eight representative tractor manufacturers, large and small. Numbers are substituted for names to conceal identities.

Reference to this table will show that the industry is active in engineering new and improved products, in establishing new sales outlets and in providing extensions of buildings and equipment for increased production. One company makes no report on 1928 business as compared with 1927 and one reports about the same volume, but the remaining six all report increases. The belief that 1929 is going to be a prosperous period is unanimous. Price changes, where made, have been downward.

Summary of Trends in Tractor Industry—1928

(Based on data from eight representative companies)

Companies	New models introduced or old models redesigned	Important price changes	New sales outlets established	Increase in production facilities	Total business as compared with 1927	Business outlook for 1929
Company 1	New model	No	Yes	Yes	Better	Excellent
Company 2	.....	No	Yes	...	.....	Good
Company 3	No	No	...	No	Same	Good
Company 4	New model	No	Yes	No	Better	Good
Company 5	New model	Reductions	Yes	Yes	Better	Good
Company 6	New models	Reductions	Yes	Yes	Better	Excellent
Company 7	Improvements	Reductions	Yes	Yes	Better	Excellent
Company 8	New models	No	Yes	Yes	Better	Excellent

Most of the new tractor models recently introduced appear to be designed to take advantage of any opening in the market which may be left by Ford, being, in the main, two-plow types of less than 25 belt horsepower. This, of course, is the big tractor field and with Ford pret-

ty much "on the fence," it looks attractive to manufacturers who have not seen fit to invade it heretofore.

While the small tractor still is the mainstay of the industry, sensational gains have been made in the last two years in the sale of heavier types. These gains are due chiefly to the increased demand of farmers for combines—combination grain-cutters and threshers—which are rapidly replacing the old-time combination of steam tractor and grain separator. While the modern combine has been available for some years, it is only recently that it has come into general use. When first introduced it was considered suitable for service only in certain parts of the country where perfectly dry weather prevailed during the ripening season. Investigation has proved, however, that crops can be brought up safely to the necessary degree of ripeness on the standing stalk in almost any section of the country, with the result that combines are coming into universal use. They cut the grain and thresh it in one continuous operation, enabling two men to do the work formerly requiring 20.

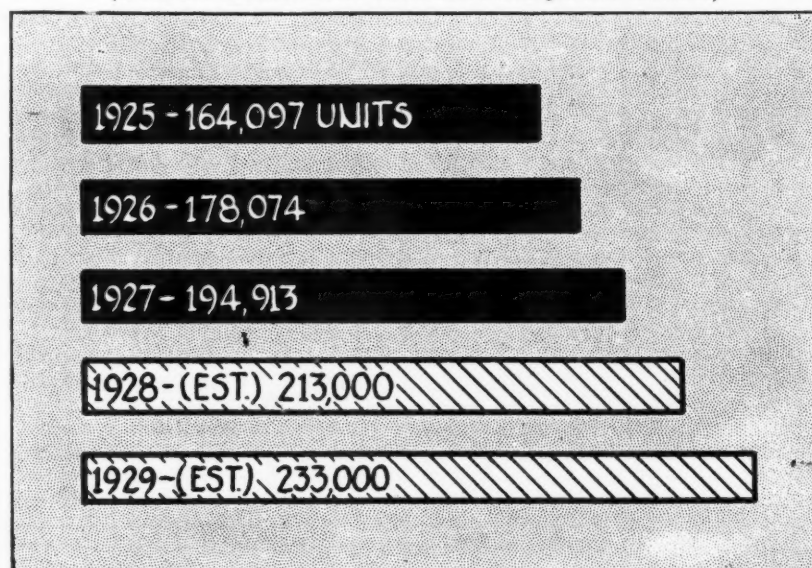
That combines could be sold only to farmers with exceptionally large acreages under tillage is another theory recently exploded; a number of them have been sold this year to farmers in Pennsylvania, Delaware and other Eastern States where the farms are all relatively small.

Another development that is accelerating tractor sales is a mechanical corn picker and husker for which a strong demand has materialized recently among farmers.

Since about 90 per cent of all tractors sold at present are used for agricultural purposes—the other 10 per cent being for industrial work—the condition of the farmer's pocket-book is regarded by the industry as its sales barometer and the opti-

Tractor Production in U. S., 1925-1927, With Estimates for 1928 and 1929

(Does not include motor cultivators and garden tractors)



mism with which tractor manufacturers view business prospects for 1929 is based largely on the fact that the present crop year promises to enhance materially the purchasing power of farm operators as a whole.

Secretary of Agriculture William M. Jardine has just given this fact official confirmation in his annual report to the President. Indications are, he says, that the gross income of American agriculture for the crop year 1928-29 will be larger than that of the preceding crop year. It is impossible to make an accurate estimate of the increase, however, as the present marketing season still has some months to run. "In general," the report states, "the situation is less uneven than in any year since 1920. There are fewer distress areas. Many branches of the agricultural industry record new gains in the efficiency of production, and likewise in the adjustment of supply to demand. In all probability the improvement in gross income will be reflected in a proportionate increase in net income, because the evidence available indicates that production costs in 1928 were not larger than in 1927 and may have been smaller."

A survey of agricultural conditions made by Standard Statistics Co. prompts the statement that "agriculture in the United States is, on the whole, on a more profitable basis at present than at any time in a decade. The purchasing power accruing from the 1928 crops is in considerable measure responsible for the sharp increase recently in mail order sales and in general retail trade volume throughout the agricultural sections. It doubtless is responsible also in large measure for the increased sales of automobiles, radios, tractors, and a wide range of other products purchased on a large scale only in periods of better than average returns."

Estimating values on the basis of prevailing average future quotations and the Nov. 1 estimates of probable yield, Standard Statistics places the hypothetical value of the nine leading farm products for 1928 at a

level 5.9 per cent above the 1927 estimated value.

Shown herewith is a chart picturing production of wheeled and tracklaying tractors for 1925, 1926 and 1927 and estimating production for 1928 and 1929 by assuming for the latter years the same average percentage increase that has prevailed since 1925—about 9 per cent. This puts 1928 production at 213,000 units, and indicates that 1929 production ought to be about 233,000 units. Official 1928 production figures will not become available until the U. S. Bureau of Census completes its annual survey of the manufacture and sale of farm equipment, about March 1, next year.

Aside from natural growth, tractor manufacturers expect tractor sales to mount steadily in the future through the development of new implements and attachments which will open to them new fields of usefulness. The tractor is primarily a source of power and its growth is dependent on the development of new means of utilizing this power. Fortunately, the business of devising new labor and time-saving implements which can be operated by tractors is an industry in itself and there is little question that the future will bring forth many more developments rivaling in importance those of the past.

Predictions are now being made that there will come a day when practically all the heavy farm work in the United States will be done by tractors. George B. Bell, chief, Agricultural Implements Division, Department of Commerce, is one who sees the tractor virtually eliminating the horse from the farm. "There are," he says, "at least 20 farmers in this country at the present time who do not have a work horse on their farms."

This is a small number as numbers ordinarily go, and yet it is large enough to be deeply significant to an industry which up to the present century had depended entirely on man and animal power since the beginning of time.

Nine Body Models in New Packard De Luxe Line

FURTHER details concerning Packard's new de luxe line, of which mention was made in *Automotive Industries* of Sept. 8, are announced this week by the Packard Motor Car Co.

This additional line, which will be fitted with bodies by custom builders, will give Packard cars in three separate price classes, as prices on the custom-built jobs will range up close to \$10,000.

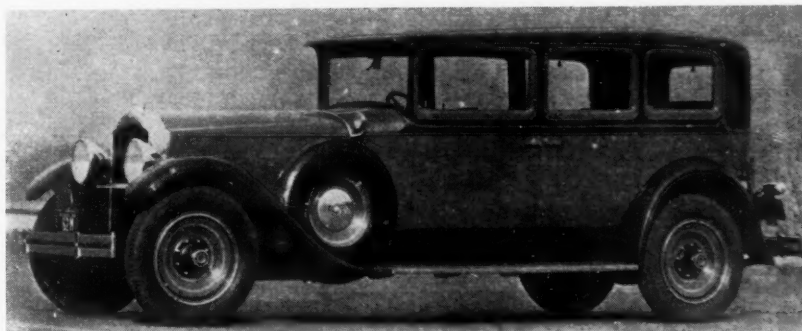
The new line, on the 145-in. wheelbase eight-cylinder chassis, comprises the following models: Seven-passenger touring, five-passenger phaeton, five-passenger sport-phaeton, two-passenger coupe, five-passenger coupe, five-passenger club sedan, seven-passenger sedan, seven-passenger sedan-limousine and a runabout.

All models have adjustable driving seats. Wind screens on the open models fold forward over the tonneau, giving a clear sweep to the long lines of the car. As in other models, the radiator, lamps and other exterior bright parts are chromium-plated. A wide choice is given in upholstery combinations and cars will be painted as desired by the purchaser.

A noteworthy feature of the new cars is a metal apron which is used to cover

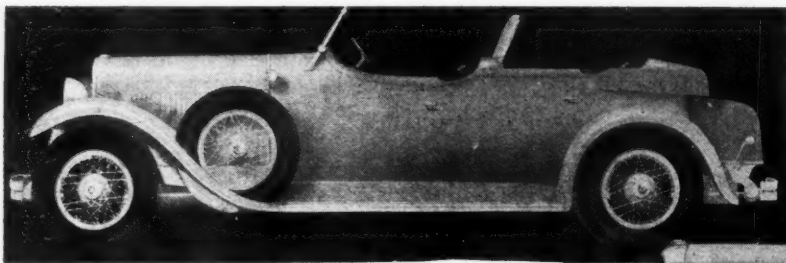
the gasoline tank and the rear end of the frame and springs. A trunk rack fits well on the gasoline tank apron, and the rear bumper is a real built-in feature. Two spare wheels with tires as standard equipment are mounted in wells in the forward fenders. Leather spring covers are provided as standard equipment for all four springs.

The frame of the de luxe eight is of pressed steel 8 in. deep and made rigid with torsion tubes and heavy cross channels. Despite its great length the new cars have a turning radius of only 26 ft. 4 in. and this with a straight-tapered frame without offset.



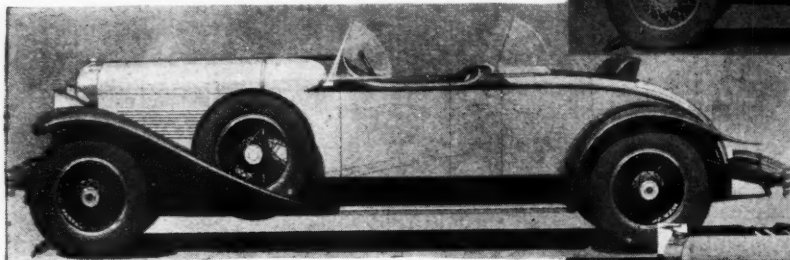
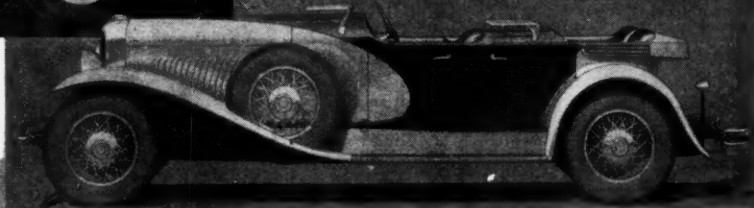
Packard de luxe sedan

A Group of Salon Sport Cars



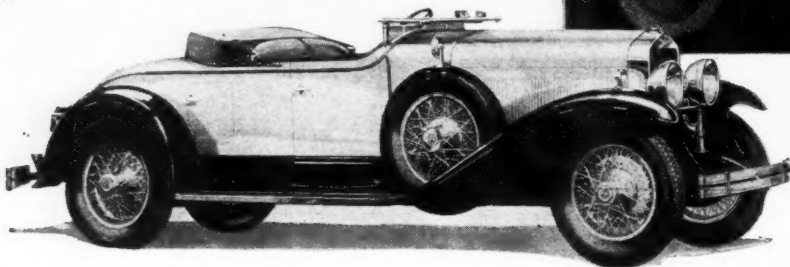
Left—Chrysler Imperial sport phaeton by Locke. Tonneau windshield completely disappears in partition by operation of a handle. Main color is gray with primrose yellow moldings, underside of fenders, chassis and brake drums

Right—Duesenberg phaeton by LeBaron with long and rakish panel treatment and unusual arrangement of hood louvres and tonneau cowl and windshield



Left—Stutz roadster-phaeton by LeBaron. The tonneau windshield disappears into the partition and the rear seat back swings forward to form a rear deck

Right—Lincoln aero-phaeton by LeBaron with full streamlines, aerofoil section front fenders, cockpit-type front and rear seats and a aeronautical tail assembly



Left—La Salle two-passenger roadster by Fisher. It is finished in green, gold and purple maroon which, combined with the lines of the body, makes a striking sportive appearance

THE twenty-fourth annual Automobile Salon which has been in progress in New York all this week is probably one of the best exhibitions ever held in this country.

With all the leading *carrossiers* of the world offering their latest developments in body designs and with several new chassis being presented to the public for the first time, public interest in the exhibition has been high all week.

Of the nearly 100 cars exhibited, 31 per cent are of the convertible type, 28 per cent are standard sedans, coupes or owner-chauffeur driven limousines, while but 27 per cent of the chauffeur-driven, formal town-car type which formed the backbone of Salon exhibits a few years ago. With open cars representing 14 per cent of the total displayed, 45 per cent, or nearly half, of the exhibits appeal to buyers with young ideas who desire an element of sportiveness in their automobiles.

Contrary to the tendency shown in body styles, colors were generally more somber than they have been in years. Color effects were uniformly beautiful but obtained by closer attention to harmonies and with less thought toward simply striking appearance. Green was

Sport Type Cars

*Open and convertible
half of exhibits.*

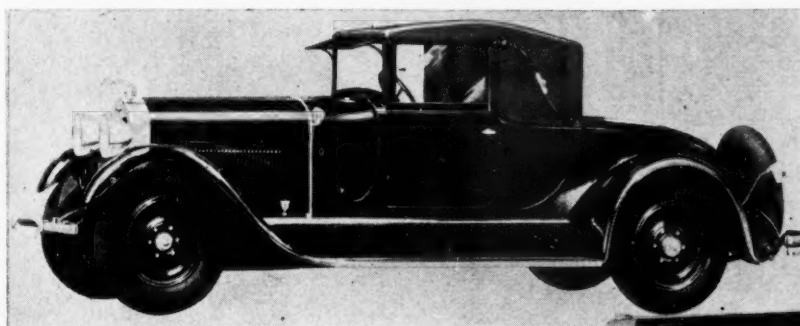
By K. W.

the favorite color with nearly 30 per cent of all models shown having some shade or tone of green as the basic color. Next, in their order of popularity with Salon exhibitors, came black, brown, red, blue, yellow or cream and gray.

Of course, any attempt to segregate the colors into definite classes like this is done with considerable temerity since the many combinations often defy description in ordinary color terms.

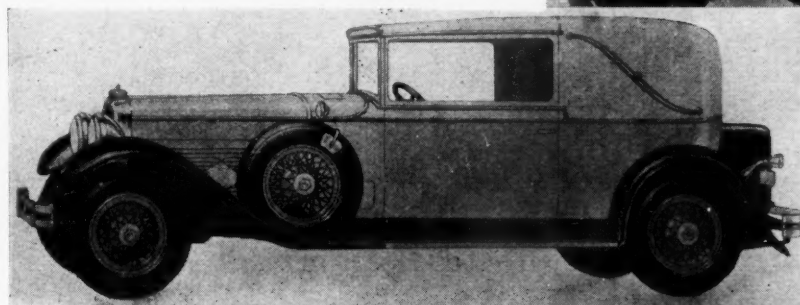
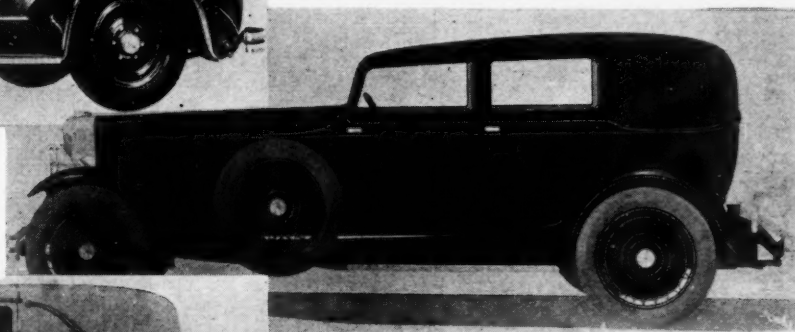
Some of the outstanding developments in detail de-

Closed Models at the Salon



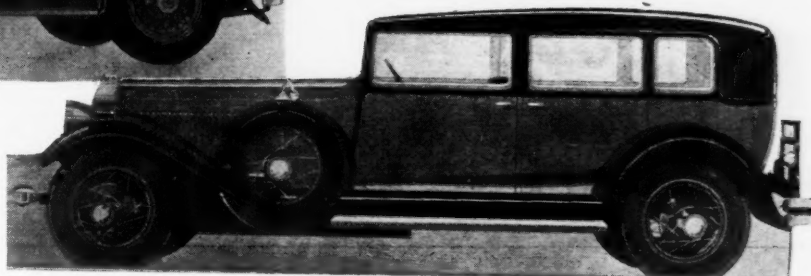
Left—Lincoln club roadster by Locke. Unique molding treatment features this job, which has a collapsible top, rumble seat and golf club compartment. It is finished in deep maroon with black upper structure, moldings and rear deck and maroon upholstery

Right—Duesenberg five-passenger sedan by Holbrook



Left—Weymann Deauville model on Stutz chassis. It is a four-passenger body with the interior finished in snake skin upholstery. The usual Weymann fabric leather body panels are employed

Right—Stearns seven-passenger inclosed drive limousine by Judkins. Front seat is upholstered in leather with rear seat in Wiese cloth. Superstructure, moldings, fenders, splashers and chassis finished in black; lower body panels, hood and wheels in blue, and window reveals in gray



Dominate at Salon

models make up nearly
Colors toned down.

Stillman

sign features were the extended use of polished metal for hoods, cowls, belts and moldings; narrow cast pillars between front and rear doors; hanging of front and rear doors on the same set of hinges; employment of polished wood running boards with metal grooves; tonneau windshields which disappear into the partition between the seats; fitting of trunks; a very great improvement in simplifying interiors and harmonizing them with exterior finishes and a number of refinements to provide still greater riding comfort for both front

and rear seat passengers.

This Salon is particularly inclusive with coach work exhibits by Brewster, Brunn, Castagna, Derham, Dietrich, Fisher, Fleetwood, Floyd-Derham,

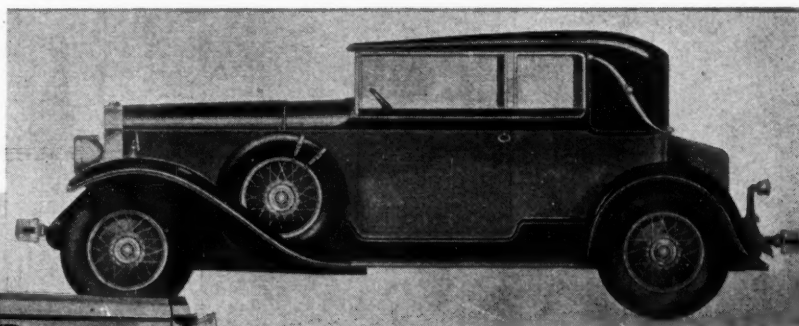
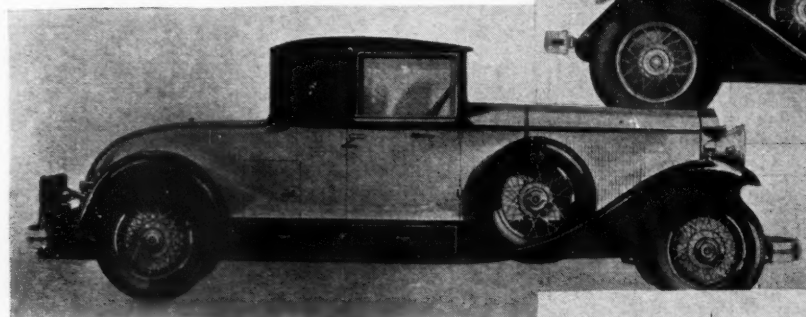
Hibbard & Darrin, Holbrook, Judkins, LeBaron, Locke, Murphy, Rollston, Weymann and Willoughby showing bodies on Cadillac, Chrysler, Franklin, Duesenberg, LaSalle, Lincoln, Packard, Pierce-Arrow, Stearns-Knight, Stutz, Cunningham, Isotta-Fraschini, Lancia, Mercedes, Minerva, Renault and Rolls-Royce.

New chassis exhibited for the first time included the new Duesenberg; two new Renault chassis, the Reina-stella, a new straight-eight, 90 by 140 mm., engined model having the radiator in front in accordance with standard practice but in which the typical Renault appearance has been retained, and the Monastella, a little six-cylinder 58 by 93 mm. model; and a new Lancia chassis with a conventional box frame which is to be produced in this country at the former Fiat plant in Poughkeepsie, N. Y.

One of the most striking jobs was a Lincoln aero-phaeton by LeBaron which, in every detail, is reminiscent of airplane practice. The exterior is streamlined

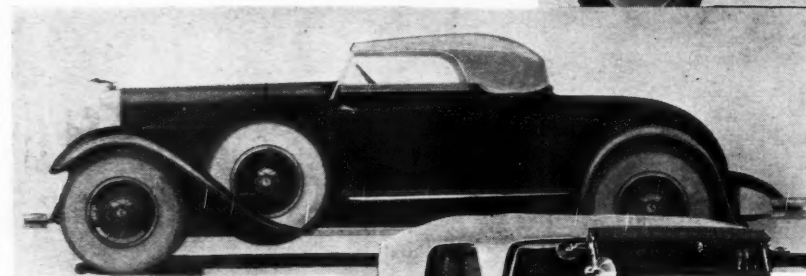
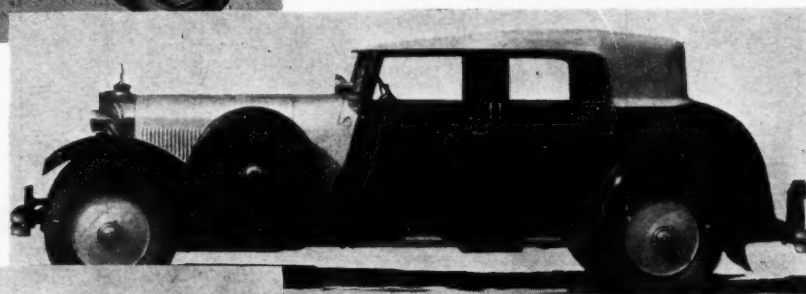
A Few Convertible Models

Right—Franklin convertible victoria by Dietrich. This model occupies a place between a sedan and a coupe and is furnished with two front seats, the driver's being adjustable and the other folding, and two rear cushions which can be folded out of the way when not in use. The entire top can be lowered



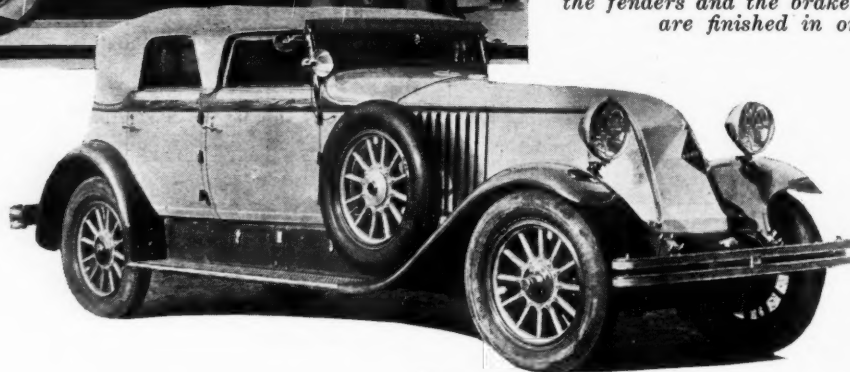
Left—Cadillac convertible coupe by Fisher. Rumble seat in rear compartment. Following the Fisher color motif of the exhibition, this car is finished in pale blue, gold and gray

Right—Mercedes four-passenger convertible by J. Saoutchik of Paris. This unusual body is mounted on the Model K chassis and is capable of attaining a speed of 110 m.p.h. The polished metal hood and disk wheels give it a distinctive appearance



Left—Lincoln convertible coupe by Derham. This job is very low and smart. The top folds low, making it appear like a roadster. The entire car is painted black except the reveals, underside of the fenders and the brake drums, which are finished in orange

Right—Renault convertible sedan by Hibbard & Darrin. It is mounted on the 40-hp., six-cylinder chassis



without a break from the aerofoil section front fenders to the aeronautical tail assembly. Front and rear seats are of the cockpit type, divided by a broad deck and the instrument board carries tachometer, altimeter, compass and other aeronautical devices.

The entire hood and the streamlined disk wheels of this job are finished in polished aluminum; the fenders and chassis are in maple leaf green while the leather upholstery is the same color as the fenders and is in plain pleats, without welts or bindings, according to airplane practice.

Another unusual LeBaron exhibit was a Stutz roadster-phaeton. Fully open, this looks like a close-coupled, four-passenger phaeton with double windshields, tonneau cowl and collapsible top. The tonneau windshield can be lowered into the partition, the rear seat brought

forward to form a deck, and the four-bow top concealed completely in the deck compartment behind the rear seat, all of which gives the job the appearance of an unusually sporty roadster.

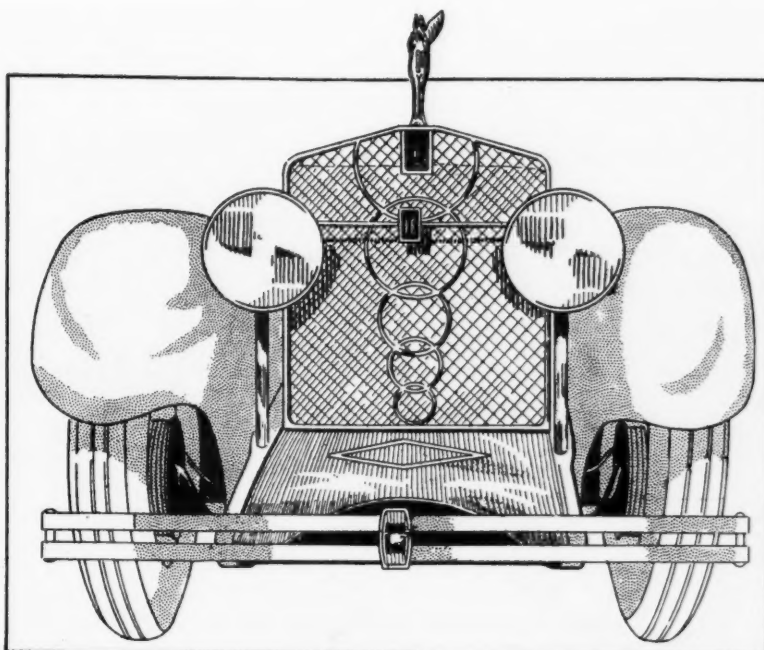
A long sweep-raised panel is carried through the top of the hood, spreads across the cowl and sweeps backward in the form of a molding. Special fenders of the new LeBaron "Dolphin" type are introduced on this model. These have a heavy crown over the wheel but trail off into thin ribbon-like sections to the rear.

Still another unusual LeBaron exhibit, but this time of a more sedate nature, is the lady's town brougham, on a Stutz chassis. The entire body is made as if of one piece of metal with no molding whatsoever. Rolling and rounded lines are all blended in a very pleasing manner. The entire body is finished in the blue of a

"poilu's" coat with the wheels in the red of the coat lining. Round door knobs working by means of a rack and pinion are introduced on this model.

Dietrich has been one of the foremost of convertible body designers and models shown at the Salon uphold this reputation. A Packard convertible victoria has two individual front seats, the driver's seat adjustable, and the one on the right folding to provide entrance to the rear seating arrangement which consists of two seat cushions which can be folded up to provide space for luggage. In all Dietrich convertibles the top can be folded and stowed away in a very small space and very low.

Among the Locke exhibits was a Chrysler sport phaeton finished in gray and yellow—the gray being applied to the body, hood, aprons, fender tops and instrument board with primrose yellow being used on moldings,



The treatment of this Castagna body for Isotta-Fraschini is indicative of the trend toward more workmanlike fronts

close with the doors, together with the small center glasses, swing into a center frame construction which extends across the body back of the front seat. In this position, the glasses can be left up to provide a tonneau windshield or the entire assembly can be lowered out of sight into the partition.

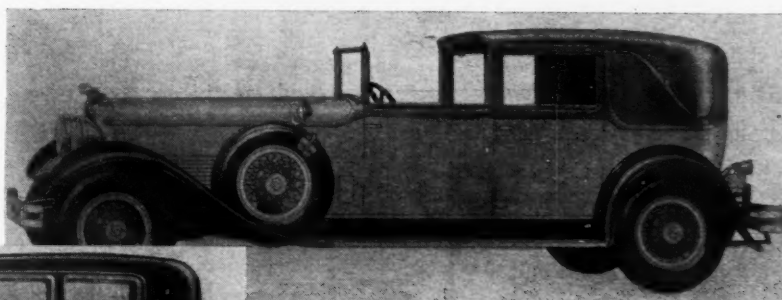
Just one color is used on this body—Ceylon blue—

underside of fenders, chassis and brakes. The tan Burbank top folds very flat. Black leather upholstery is used. Cushions and backs are plain while the quarter panels extend over the rolled moldings and are finished off with a small beaded molding. In this model, also, the tonneau windshield disappears completely into the partition between the front and rear seats.

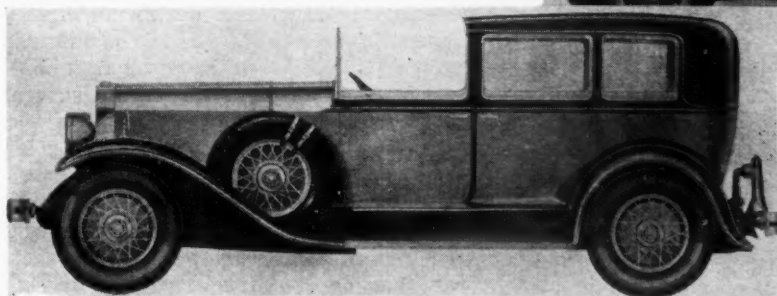
Windshield equipment is even more complete in another Locke-Chrysler job, this time a convertible sedan. The rear door glasses, which open and

Formal Town Car Designs

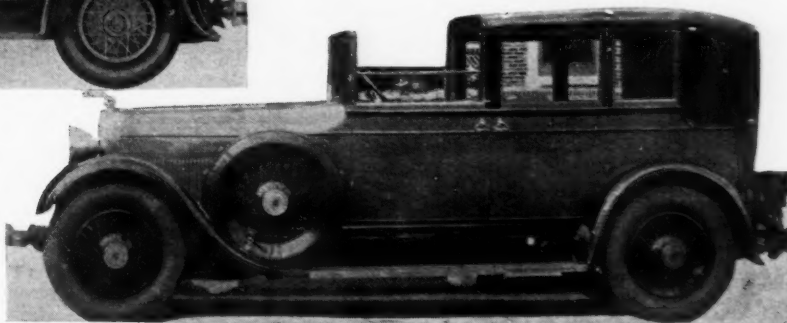
Right—Stutz transformable town cabriolet by Fleetwood

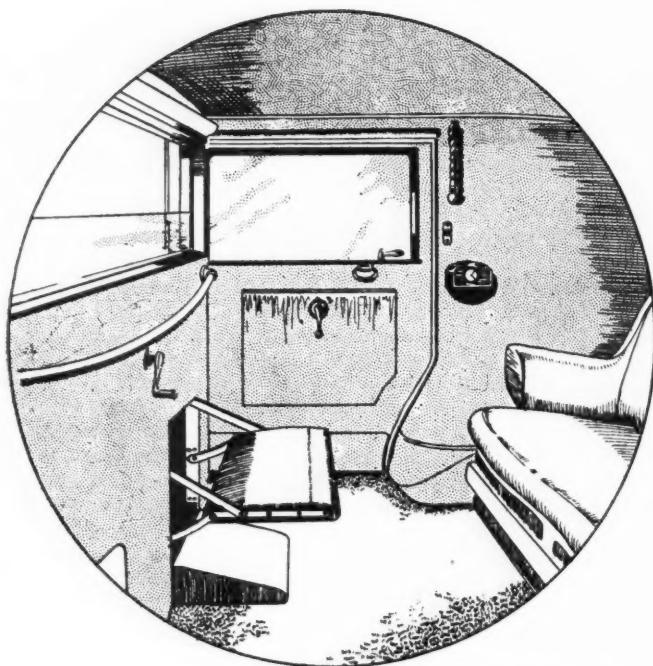


Left—Franklin all-weather town car by Willoughby. The wide front doors conceal nickel glass frames and a curtain deck is provided for the driver

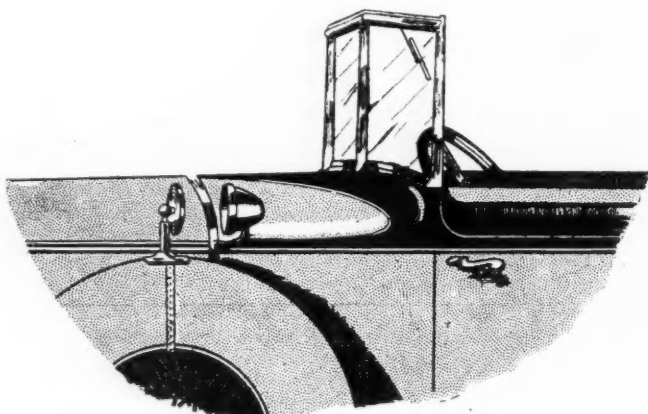


Right—Lincoln all-weather brougham by Brunn. With the cover over the driver, this body is converted into a seven-passenger limousine. Extra side windows provide full vision for rear seat passengers

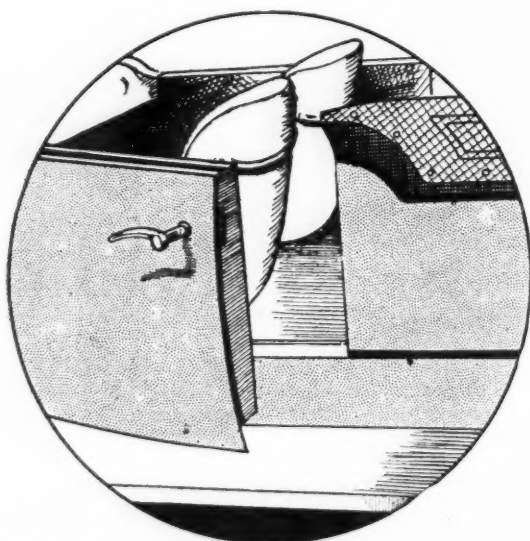




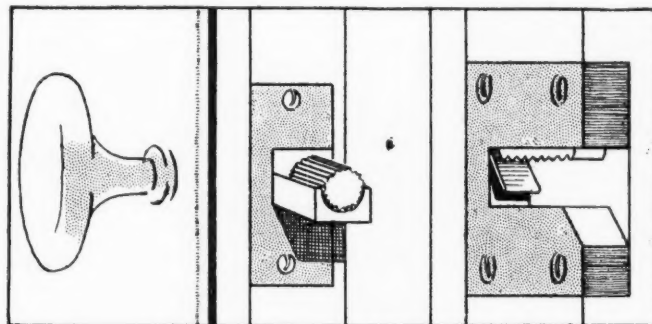
Interior of an all-weather cabriolet designed by Dietrich



An interesting molding treatment is found on this Packard all-weather cabriolet by Rollston



Several two-door, four-passenger bodies have very wide doors like this Fleetwood-Cadillac

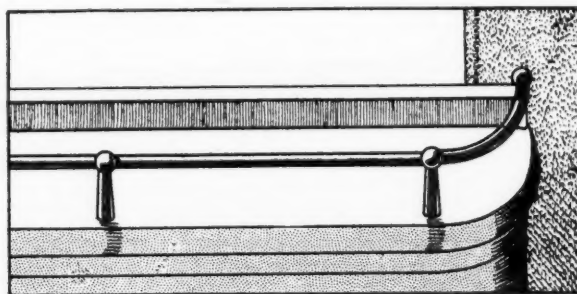


In an exceptionally low body by LeBaron for Stutz a new type of door handle and latch was introduced

which is applied even to the hubs and felloes of the natural wood wheels. Seats and backs are upholstered in Bedford cord while other trim is blue leather to match the exterior.

While having been used for several years in certain production cars and not entirely new to custom bodies, it is worth while noting that a Locke-Chrysler collapsible coupe has a large door on the curb side to facilitate entrance to the rumble seat.

The Rolls-Royce display contained a number of interesting jobs, one very good-looking Brewster body being a four-passenger speedster finished in two tones of gray with polished aluminum disk wheels. A feature of this job was a flute in the body moldings, fenders



An attractive decorative treatment for the rear of the front seat in a Judkins-Stearns-Knight limousine

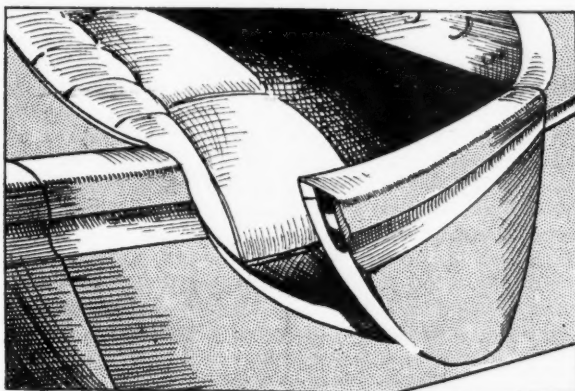
and running boards, these also of polished aluminum.

Holbrook had among its exhibits a convertible coupe on a Franklin chassis with a particularly pleasing color combination of pastel cream with black moldings on the hood, body and superstructure and black wire wheels.

A Weymann Deauville model on a Stutz chassis was upholstered in snakeskin leather. Another new upholstering material was a new rayon cloth used in several Fleetwood bodies.

Willoughby obtained some interesting effects in color harmonies, a good example being a Lincoln four-passenger town sedan. The exterior is solid gray-green. The through oval and belt molding, the collar molding at the cowl, a drip molding turning down into a belt at the rear of the rear door and the window reveals are all finished in green, as are the underneath chassis parts, fenders and splashers.

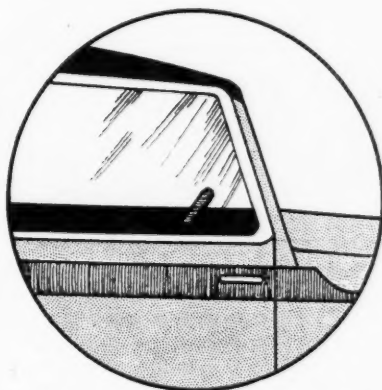
In this job, aluminum roof sides and upper rear panels are used. Front and rear door hinge pillars of manganese castings are very narrow. The doors lap together with no center pillar visible. The interior carries the same two-tone effect with light gray-green broadcloth used except on the seats and armrests, which are covered with Bedford cloth to match the moldings.



Presumably for the sake of appearance, but also to facilitate entrance and egress, curved doors are used on this Rolls-Royce body

In another Willoughby exhibit, a Packard sedan, a very wide crowned belt tapers at the collar in front to a narrow hood molding which runs into a raised top panel in the center of the cowl top. The wide convex belt on the side and doors is cut with a concave recess which forms a center panel finished in buff. Main exterior color of this job is cracker buff with the offset moldings in blue striped with the main body color.

Derham exhibits included a Lincoln convertible coupe and a Franklin sedan. The former is low and smart



A rather pronounced down-swept roof, without visor, and an interesting cowl treatment are features of this Holbrook body on a new Duesenberg chassis

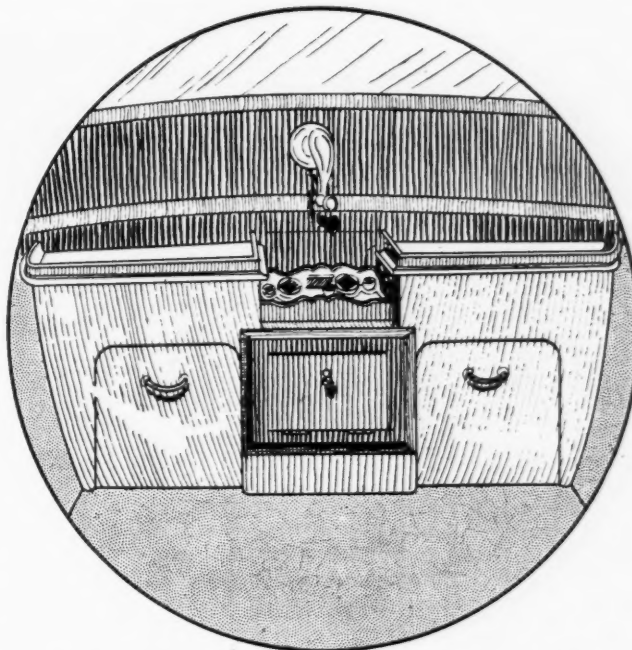
and is finished all in black except for orange reveals, underside of fenders, brake drums and striping.

The sedan is also painted black but with red chassis and striping. In this job both doors are hung on a single set of hinges at the center pillar, which is a casting and very narrow. Natural tan leather upholstery is employed on the seats and backs with the headlinings and upper parts covered with matching broadcloth.

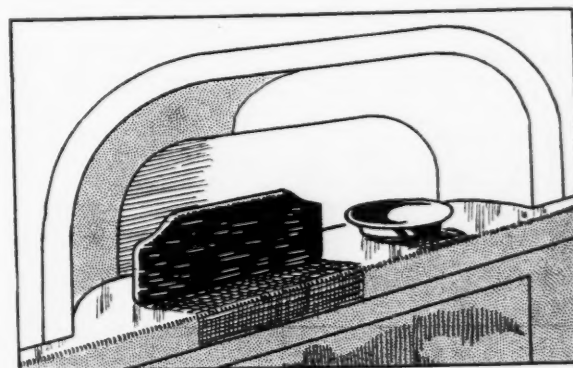
A newcomer to the Salon, Floyd-Derham, Rosemont, Pa., had a convertible sedan body mounted on an Isotta-Fraschini chassis. The top of this job folds particularly low and since the windshield folds forward and there is a pronounced downsweep to the side panels back of the windshield, when the top is down the job has every appearance of a standard phaeton.

A much more extensive use of non-shatterable glass was apparent at the Salon and the great increase in the number of open and convertible body types brought

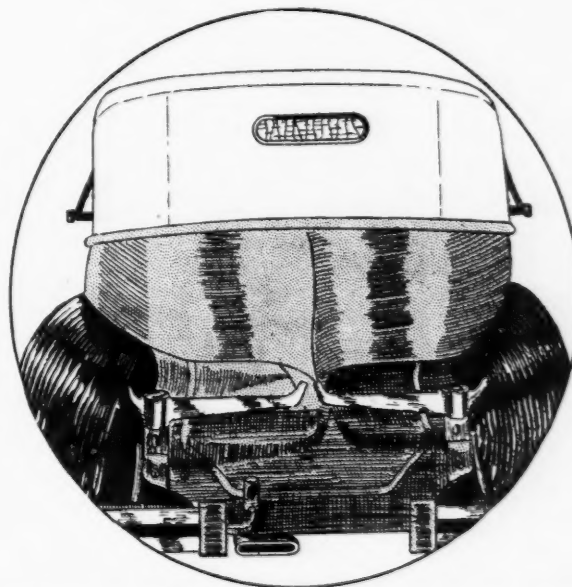
(Continued on page 839)



Rollston's arrangement of the front seat back for a Packard cabriolet is typical of the trend toward making interior accessories less conspicuous



Another example of the trend toward keeping body accessories out of the way. This beautiful hand-carved walnut paneling was found in a Brewster-Rolls-Royce body



Castagna has given as much attention to the rear view of this body for Isotta-Fraschini as to the front

Simplicity in Brake Design

By
John A. C. Warner

A NEW model is announced. What is the item of first interest in the specifications? Horsepower, of course. The capability of the engine is given great prominence, and persons who are attracted by the car give it no less attention. In the specifications, at least, the machine is enthusiastically set in motion and accelerated to a top speed a little faster than the next fellow's. In sharp contrast, the ability to stop this car with "flashing performance" is too often dwelt upon lightly, if at all.

Undoubtedly, "horsepower-of-brakes" merits general consideration more nearly paralleling that which customarily is given to "brake-horsepower." What might be termed the "power concept" of braking, if more generally recognized and emphasized, would assist materially in creating a more accurate impression of actual braking requirements than can be the case when the more familiar terms of design and performance are considered alone. A 100 hp. car may demand 800 hp. performance from its brakes, for work may actually be done at this maximum rate on a 5000 lb. automobile when the brakes are applied at 80 m.p.h.

Safety is Prime Requisite

Safety, of course, is the prime requisite for any braking system. "Safety" implies "adequacy and reliability." Good engineering practice dictates that these virtues be exemplified in company with the utmost in simplicity. There is something other than idle rambling in the trite remark that "the simplest is the best." Undue complication has defeated its own purpose in the automotive field as often as in any other.

With a properly designed, simplified braking system, safety is insured through the elimination of points and parts where trouble may occur; maintenance requirements are diminished and simplified; manufacturing and installation demands and processes are reduced in number and become less complex. In fact, the advantage of simplicity reveals itself from many angles. Simplicity, refinement and increased reliability

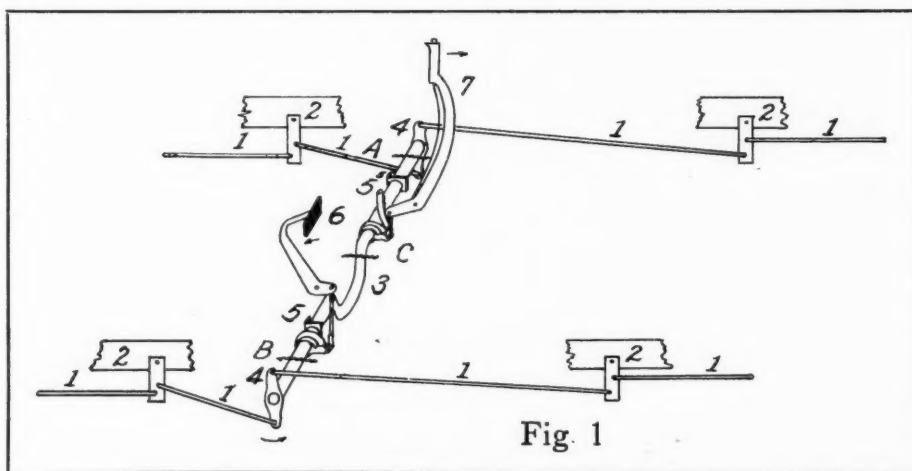


Fig. 1

bility generally progress hand-in-hand as mechanisms are improved.

"Safety at all costs" is the engineer's responsibility. Upon him rests the burden of providing braking facilities that are safe and adequate, not only under normal conditions of operation but under unusual circumstances as well. The fact that an element of responsibility falls upon the operator in the matter of adjustment and maintenance in no wise diminishes the obligation of the engineer. By providing accessibility and simplicity of adjustment in the product, the engineer can, in a measure, prepare in advance for possible deficiencies on the part of the operator.

Current interest in brake hookups indicates the desirability of studying a typical example of simplified design which has been used extensively and which has been subjected to comprehensive tests based upon the requirements of safety. To establish a criterion for analysis, several fundamental requirements are stated as a basis for discussion.

It may be specified for example, that "the vehicle shall be equipped with brakes adequate to control the movement of and to stop such vehicle."

Practically all automobiles of today are capable of fulfilling satisfactorily this provision. Four-wheel braking equipment has certainly reached the point where automobiles can be controlled properly and stopped with reasonable dispatch and safety. A stopping distance of 20 ft. or less from a speed of 20 m.p.h. is "everyday" performance for thousands of automobiles now in operation.

Further, it might be required that "the automobile shall be equipped with at

TO focus attention upon a very essential and important element in automobile braking, the author of this article reviews the present status of brake hookup arrangement on modern passenger cars and explains the advantages of simplification.

Particular interest attaches to simplified design, especially as it involves the common cross-shaft type of hookup which has attracted considerable discussion among engineers, motor vehicle administrators and legislators.

The conclusions and observations set forth with respect to the simplified type of hookup have resulted from field experience with various makes of car and from numerous tests and demonstrations.

Best from Safety Standpoint

*Properly designed system minimizes
points where trouble may occur.
Easier to keep in condition.*

least two braking systems, with two separate means of application, each operating on at least two wheels and each of which shall suffice to stop the vehicle within a proper distance."

The example shown in Fig. 1 provides two such systems. Certainly, the intent of the requirement for two systems is to assure that a second workable and effective means of braking will remain if the first should fail. The combination of brakes and hookup, including the parking lever and linkage, at the right of the car (Fig. 1) may be considered as one system, whereas the remaining brakes and hookup, including the pedal and linkage, at the left of the car, constitute a second system. The logical criterion for this conclusion that there are two braking systems, rests in the possibility physically to isolate one system completely from the other, through the cutting of the cross-shaft, and still leave both systems workable and effective. A clear demonstration of this test is outlined below. Further, it is shown that the front combination and rear combination of brakes can reasonably be considered as two systems. The cross-shaft is common to the two systems. This feature is recognized and is amply provided for in the additional specification of requirements mentioned below.

Two Means of Application

The pedal 6 and hand-lever 7 of Fig. 1 constitute two separate means of application. Each of these operates simultaneously on all four wheels. The effectiveness of the one means of application is equal to that of the other and both provide maximum stopping ability.

With an initial speed of 20 m.p.h. a stopping distance of from 35 to 40 ft. can be expected from a properly braked car with either the front or rear system alone in operation.

Additional requirements may demand that "if these two systems are connected in any way, they shall be so constructed that failure of any one part of the operating mechanism shall not leave the automobile without brakes on at least two wheels. Further, that one of these sys-

tems shall be so constructed that it can be set to hold the vehicle."

The two systems of the typical layout are in reality connected by the common cross-shaft 3 and the cross-shaft outer levers 4. As will be shown, the failure of any part of the cross-shaft assembly that is common to the two systems will not leave the automobile without brakes on at least two wheels.

Solid Steel Cross-Shaft

The cross-shaft itself is a solid steel member, suitably proportioned for equalization and possessing a very large safety factor. The outer-end levers, steel forgings, are securely keyed at the ends of the shaft. Two or more bearing brackets serve as mounting and positioning units to hold the shaft in a well-protected position along a cross-member of the frame. Altogether this cross-shaft may be designed and located in such manner as to preclude even a remote possibility of failure.

But, for the sake of discussion, suppose that this member, common to the two braking systems, should be fractured. There are three interesting sections where the torch may be applied to a typical common cross-shaft hookup to determine experimentally the result of fracture. Assuming that three different shafts are to be cut successively and tested, suppose the first shaft to be cut at A, Fig. 1. Obviously, and by actual test, it is found that this fracture leaves the car with normal brakes, either hand-controlled or pedal-controlled, on the left front and rear wheels. This condition will exist, no matter where the shaft is cut, so long as the fracture rests between the hand-

lever connection and the right end of the shaft.

Next, a new shaft is installed and then cut at B. This leaves the car with brakes, controlled either by hand or foot, on the front and



John A. C. Warner

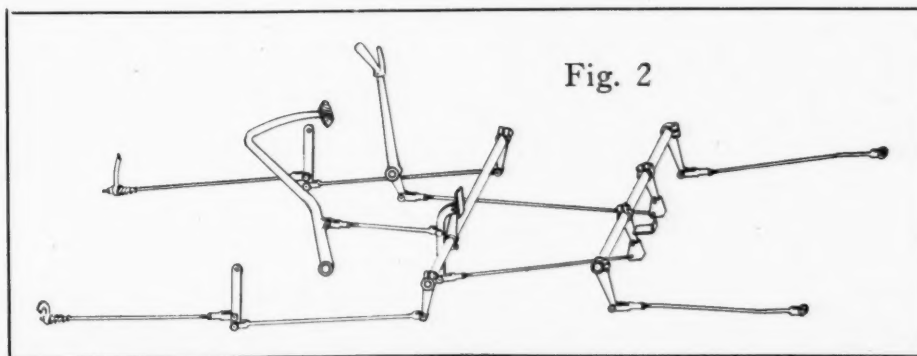


Fig. 2

Fig. 3

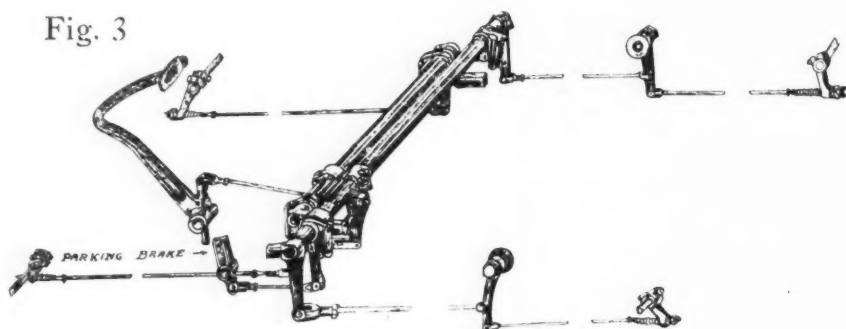


Fig. 4

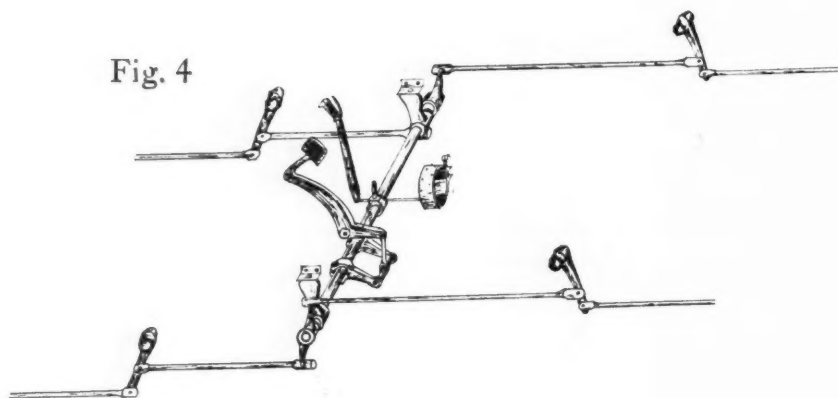


Fig. 5

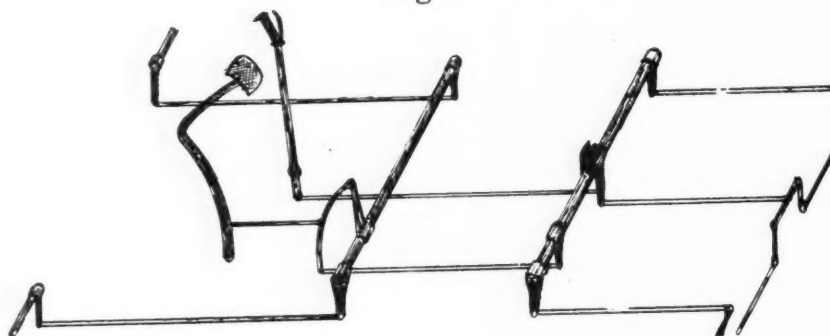
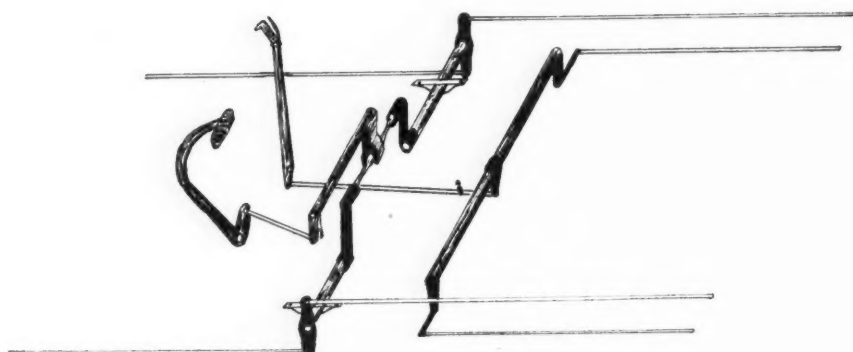


Fig. 6



rear wheels on the right. With the braking effective upon two wheels, front and rear on either side of the car, a reasonably satisfactory deceleration can be obtained.

Finally, a newly installed shaft is cut at *C* between the control connections. In this case, the pedal is operable normally upon the two brakes at the left, whereas the hand-lever is workable to control the brakes at the right. Also, the pedal and lever can be operated simultaneously to provide braking on all four wheels.

In the manner outlined above, it is easily demonstrable that the common cross-shaft hookup can be built, and, in fact, is being built into thousands of cars of various makes to answer very amply every safety requirement.

But, to carry the examination still further, it is evident that the breakage of either of the cross-shaft outer levers will leave the car with the two brakes, at the side opposite the breakage, intact and operable by both means of control.

Considering for a moment the controls, suppose that there is failure in the pedal linkage 6. Four brakes will still be operable from the hand-lever control 7. Similarly, throwing the hand-lever control out of operation all four brakes are found to be operable from the foot-control.

What would happen in the event that the cross-shaft bearing brackets 5 were to break? Detaching these entirely from their point of mounting, it is found that the brakes operate satisfactorily through the unsupported cross-shaft; for the hookup has been so laid out that the pull-rod and control connections to the cross-shaft hold the latter in a floating position from which it transmits the required pull upon the brake-rods.

Upon further examination of the controls, it is to be noted that the hand-control linkage is so proportioned and adjusted that the hand-lever still has a wide margin of travel and braking effectiveness after the pedal has been applied to the full extent of its travel.

This constitutes an extremely important safety feature of common cross-shaft hookups.

For example, if the owner were to allow his brake linings to become so badly worn that he could press his pedal down to the floor-board and still not obtain adequate braking effectiveness for an emergency stop, he could still call upon his hand-lever for any additional braking that might be required. The margin of reserve in the hand-lever is ample to supply any possible demands after the operator has received this warning that his linings are excessively worn.

The hand-lever can be set to hold the vehicle with the full effectiveness of all four brakes in action.

It is of interest to note that, with the present system, the complete loss of one, two or three individual brakes will not alter the effectiveness of the remaining brake or brakes. To demonstrate this point, it is only necessary to disconnect successively the pull-rods, thus throwing one, two and three brakes out of action.

Summing up the requirements enumerated above and combining them, the following complete specification is evolved. This follows the spirit of the Hoover Conference code and is, in fact, the act recently recommended for adoption by the Eastern Conference of Motor Vehicle Administrators:

Every motor vehicle operated in or upon any public highway in this State shall be equipped with brakes adequate to control the movement of and to stop such vehicle. Every automobile so operated shall be equipped with at least two braking systems, with two separate means of application, each operating on at least two wheels and each of which shall suffice to stop the vehicle within a proper distance. If these two systems are connected in any way, they shall be so constructed that failure of any one part of the operating mechanism shall not leave the automobile without brakes on at least two wheels. One of these systems shall be so constructed that it can be set to hold the vehicle. All such brakes shall be maintained in good working order and shall conform to regulations not inconsistent with this act to be promulgated by the Commissioner of Motor Vehicles. Every motorcycle

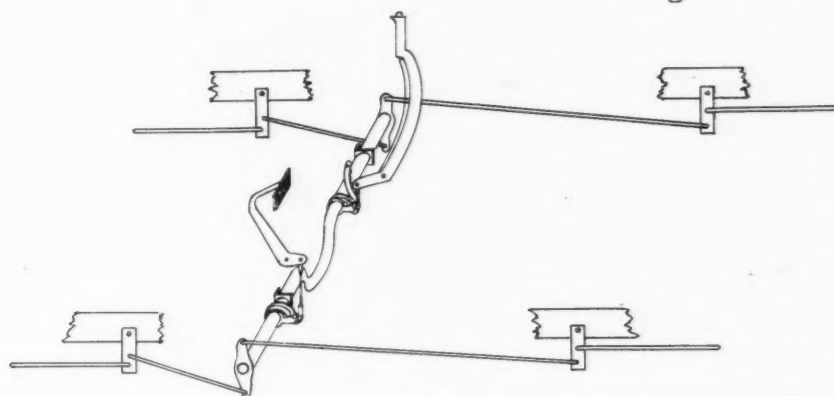


Fig. 7

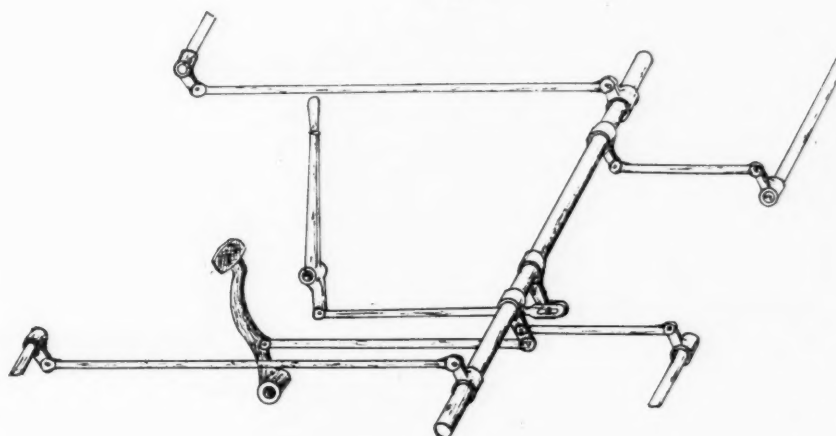


Fig. 8



Fig. 9

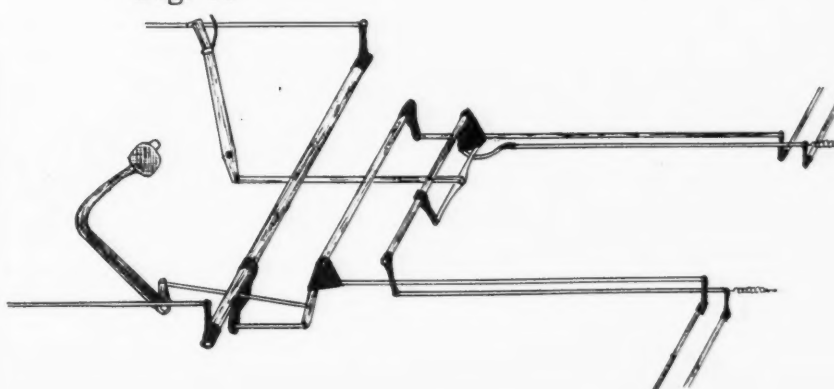
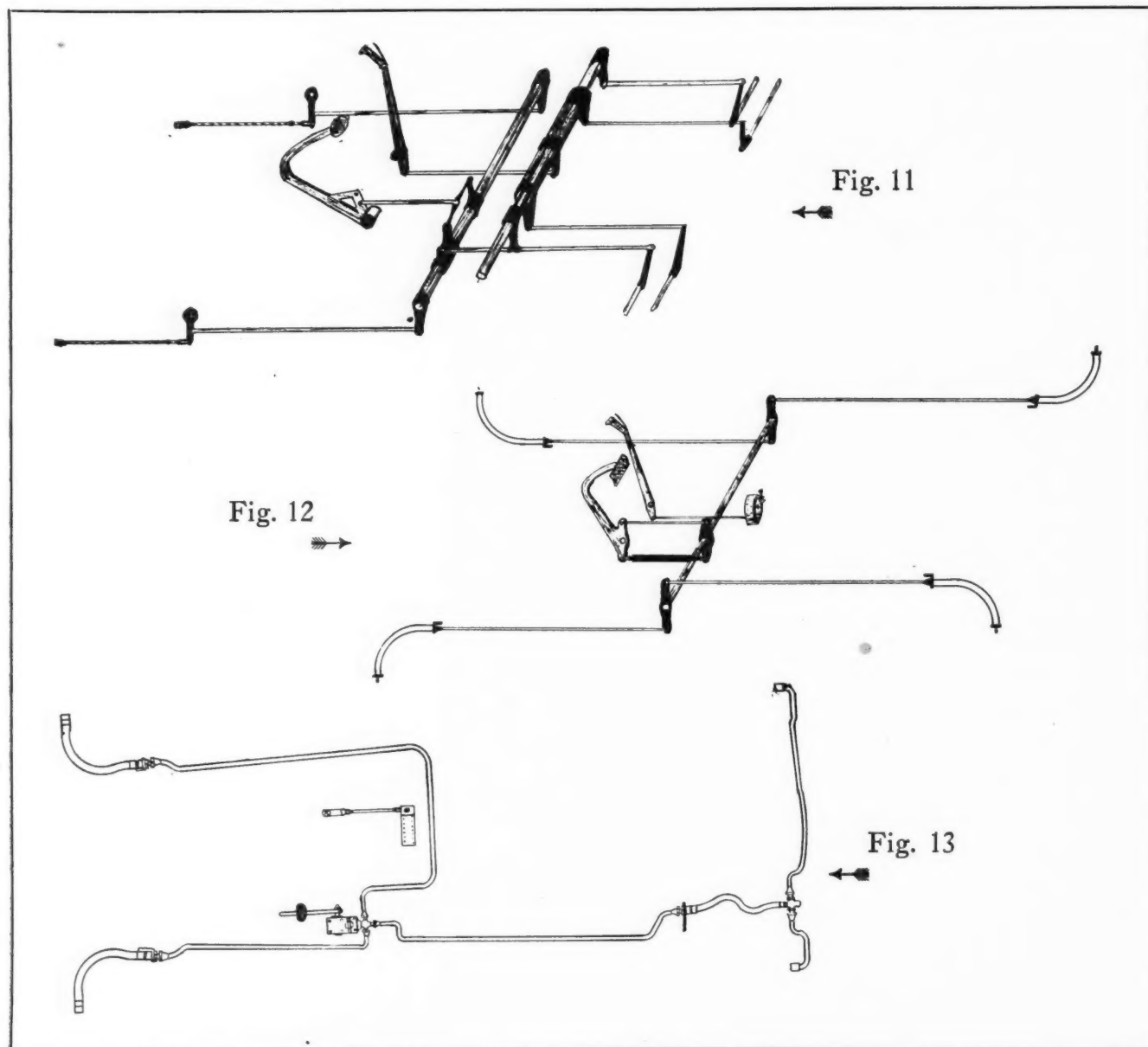


Fig. 10



shall be provided with at least one brake which may be operated by hand or foot.

Following is a summary analysis of present American practice with respect to types of brake used and their location:

Twenty manufacturers of passenger cars equip a total of 52 different chassis models with four-wheel hydraulic brakes. Of these, 30 (58 per cent) have external brakes on four wheels, operated by the foot, whereas 22 (42 per cent) are equipped with internal brakes on four wheels, foot-operated. Fifty of these models (96 per cent) are fitted with external transmission parking brakes, the two remaining models (4 per cent) are equipped with the hand lever operating on internal rear brakes.

Twenty-four manufacturers of passenger cars build a total of 52 different chassis models with four-wheel mechanical brakes. Thirty-two (60 per cent) of these models have internal brakes on four wheels for foot-operation; 14 (27 per cent) have internal front brakes and external rear brakes, foot-operated, whereas the remaining six models (11 per cent) have external brakes on four wheels for foot-operation. Of the 32 models with the foot brakes operating internally on all four wheels, 14 (44 per cent) have internal hand-

operated brakes on the rear wheels; 12 (37 per cent) have internal hand-operated brakes on all four wheels; five (16 per cent) have hand-operated external transmission brakes; one model (3 per cent) has external brakes on the rear wheels for hand operation. Regarding parking brakes on the 14 models with foot-operated brakes, external in the rear and internal in front, six (43 per cent) have the hand-lever connected to internal rears, five (36 per cent) are connected to external rears, three (21 per cent) are hand-operated on external transmission brakes. On the six models with external foot brakes on all four wheels, parking brakes are found on the transmissions of four (67 per cent) models and internally mounted on the rear wheels of two models (33 per cent).

Summarizing the parking brake situation, 96 per cent (50) of all hydraulic brake models are equipped with external parking brakes on the transmission, whereas 23 per cent (12) of the mechanical brake models are hand-operated on the transmission. Four per cent (2) of the hydraulic models have internal parking brakes on the rears, whereas 43 per cent (22) of the mechanical brake models are thus equipped for hand operation. Twenty-three per cent (12) of the mechanical brake models have internal hand-operated

brakes on all four wheels, while 11 per cent (6) operate the parking brakes externally on the rear wheels.

Three of the manufacturers who equip their cars with the brakes above mentioned provide certain of their models with hydraulic brakes and other models with the mechanical type. The 41 different manufacturers included in this analysis are those listed in the July 26, 1928, issue of *Motor Age*. Information regarding brake combinations and types was obtained largely from this source. Although certain changes have taken place, notably in the shift from external to internal units on several of the hydraulic installations, nevertheless the above analysis gives a reasonably accurate general picture of the situation. Tables 1 and 2 present the above mentioned facts in another form.

Through the good offices of the S.A.E. Research Department, diagrammatic sketches of brake hookups were made available by practically all automobile companies in the United States. The examples shown in Figs. 2 to 13, inclusive, provide ample representation of the several arrangements. Inasmuch as the sketches are largely self-explanatory, only very brief comment is necessary.

The hookup of Fig. 2 is that used on a small car in the low-price field. The hand-lever operates on external rears, while the pedal actuates internal front and external rear brakes.

Fig. 3 shows the linkage of a car that has the hand-lever operating the internal rears and the pedal operating internally on all four wheels. This arrangement provides equalization between front and rear brakes.

In Fig. 4 is seen the arrangement of a popular medium-priced car which has an external transmission brake for parking, with internal fronts and external rears for service. Automatic equalization is provided side-to-side and front-to-rear.

Parking Brake Operation

The parking brake of the hookup shown by Fig. 5 operates on equalized external rears and on non-equalized internal rears. Service brakes are effective internally on four wheels and are equalized front-to-rear.

Fig. 6 gives the arrangement for a low-priced car which has the parking brakes operating internally on the rears, while the service brakes function internally

TABLE I 4 Wheel Brakes—Type and Location			
No. of Chassis Model	4 Wheel Type	Foot Brake Location	Hand Brake Location
28	Hydraulic	Ext. 4 wheel	Ext. transmission
22	Hydraulic	Int. 4 wheel	Ext. transmission
2	Hydraulic	Ext. 4 wheel	Internal rears
Total 52	Hydraulic		
14	Mechanical	Int. 4 wheel	Internal rears
12	Mechanical	Int. 4 wheel	Internal 4 wheel.
5	Mechanical	Int. 4 wheel	Ext. transmission
1	Mechanical	Int. 4 wheel	Ext. rears
6	Mechanical	Int. fronts, Ext. rears	Int. rears
5	Mechanical	Int. fronts, Ext. rears	Ext. rears
3	Mechanical	Int. fronts, Ext. rears	Ext. transmission
4	Mechanical	Ext. 4 wheel	Ext. transmission
2	Mechanical	Ext. 4 wheel	Int. rears
Total 52	Mechanical		

TABLE II

Summary of Items in Table I

No. of Chassis Model	4 Wheel Type	Foot Brake Location	Hand Brake Location
22	Hydraulic	Int. 4 wheel	
30	Hydraulic	Ext. 4 wheel	
50	Hydraulic		Ext. transmission
2	Hydraulic		Int. rears
32	Mechanical	Int. 4 wheel	
6	Mechanical	Ext. 4 wheel	
14	Mechanical	Int. fronts, Ext. rears	
22	Mechanical		Int. rears
12	Mechanical		Int. 4 wheel
12	Mechanical		Ext. transmission
6	Mechanical		Ext. rears

on all four wheels. Two-in-one drums, so-called, are provided for the two separate internal brakes on each of the rear wheels. Service brakes are equalized, side-to-side and front-to-rear.

The hookup on Fig. 7 is arranged to operate simultaneously a pair of internal fronts and a pair of internal rears. All four brakes are controlled alike by the hand-lever and pedal. An interesting feature of this hookup is that of reserve braking in the parking brake linkage.

Fig. 8 illustrates a braking arrangement on a high-priced car. It operates internally on all four wheels, and is controlled by either hand or foot, similar to the hookup of Fig. 7.

Hookup Fig. 9 operates internal rears by hand-lever control. The service brakes are internal in front and external at the rear. Service brakes are equalized, front-to-rear.

The internal parking brakes of the Fig. 10 hookup are equalized on the two rear wheels, while the four internal service brakes, separate from the parking brakes, are equalized front-to-rear.

Fig. 11 hookup operates external brakes on all four wheels, foot-controlled. The parking brakes are internal rears. Front-to-rear equalization on the service brakes is provided. Cables instead of rods connect the two front brakes with their respective fulcrum-levers.

An interesting hookup which employs short steel-cable connections to all four internal brakes is shown by Fig. 12. A propeller shaft parking brake is provided.

A conventional hydraulic brake layout is shown by Fig. 13. Through the master cylinder which is mounted within the fluid supply tank, the pedal-controlled piston operates to provide fluid pressure to the four internal wheel cylinders with two opposed pistons in each to apply the two internal shoes. The parking brake operates on the propeller shaft.

THE Bureau of Standards, Washington, D. C., has recently issued the following research papers: No. 13, Wear and Mechanical Properties of Railroad Bearing Bronzes at Different Temperatures; No. 14, Steel for Case-Hardening, Normal and Abnormal; No. 15, Strain Markings of Mild Steel Under Tension; No. 19, Receiving Sets for Aircraft Beacon and Telephony, and No. 22, The International Temperature Scale.

High-Speed 6-Cylinder Coaches



General view of 1928 Paris Truck Show

Six-wheel chassis and Diesel engines also prominent among displays. Eight-cylinder powerplant is exhibited by Miesse of Brussels. Six American firms there

By W. F. Bradley

WITH six makers from the United States and one from Belgium, the Paris truck show, the third and last of the series of automotive exhibitions to be held this year in the Grand Palais, holds some of the international interest of the passenger car event. The American firms are G.M.C., Chevrolet, Ford, Pierce-Arrow, and the Liberty and A.S. trucks assembled here by French firms.

Outstanding features of this show are high-speed long-distance coaches, most of which are now equipped with six-cylinder engines; six-wheel chassis and a certain amount of attention given to Diesel engines. Higher road speeds and greater flexibility are being demanded by the public, and to meet this the six-cylinder engine is almost essential. While the four remains unchallenged for truck service, it is evident that the six will soon rule the field for passenger transportation. Many of the coach chassis are sold with a guarantee of 55 to 56 m.p.h., when fitted with 20 to 25-passenger coach bodies. There is only one eight-cylinder engine in the show, this being exhibited by Miesse, of Brussels, on a six-wheel coach chassis.

Scemia, a merchandising organization for Renault, has a low platform bus chassis, designed to receive 40 passengers, driven by a six-cylinder Renault L-head engine, to which a water pump has been added. The radiator is on the side of the driver's cab, which is above the engine. Ignition is by battery; lubrication is by the circulating system, with a centrifugal purifier.

Saurer is out with a new coach chassis having a six-cylinder valve-in-head 4.33 by 5.90 in. engine. This new engine has cylinders and the barrel-type crankcase in one casting, with a crankshaft in six parts carried in seven roller bearings inserted in the tunnel forming a part of the crankcase. The camshaft is in seven bearings, and is surrounded by an oil bath. Helical timing gears are contained in a housing forming a part of the cylinder casting, this housing being closed by a sheet metal plate. The radiator fan is positively driven and the crankshaft is fitted with a vibration damper. The engine, which forms a unit with the clutch and the transmission, has three-point attachment to the frame through Silentbloc oilless bushings. Bernard exhibits two new six-cylinder engines, built under Lycoming license, the smaller being about 3¼ by 4½ in., and the bigger 3⅞ by 5 in.; this



New type of armored flexible rubber band on Citroen-Kegresse creeper track machine

Featured at Paris Truck Show

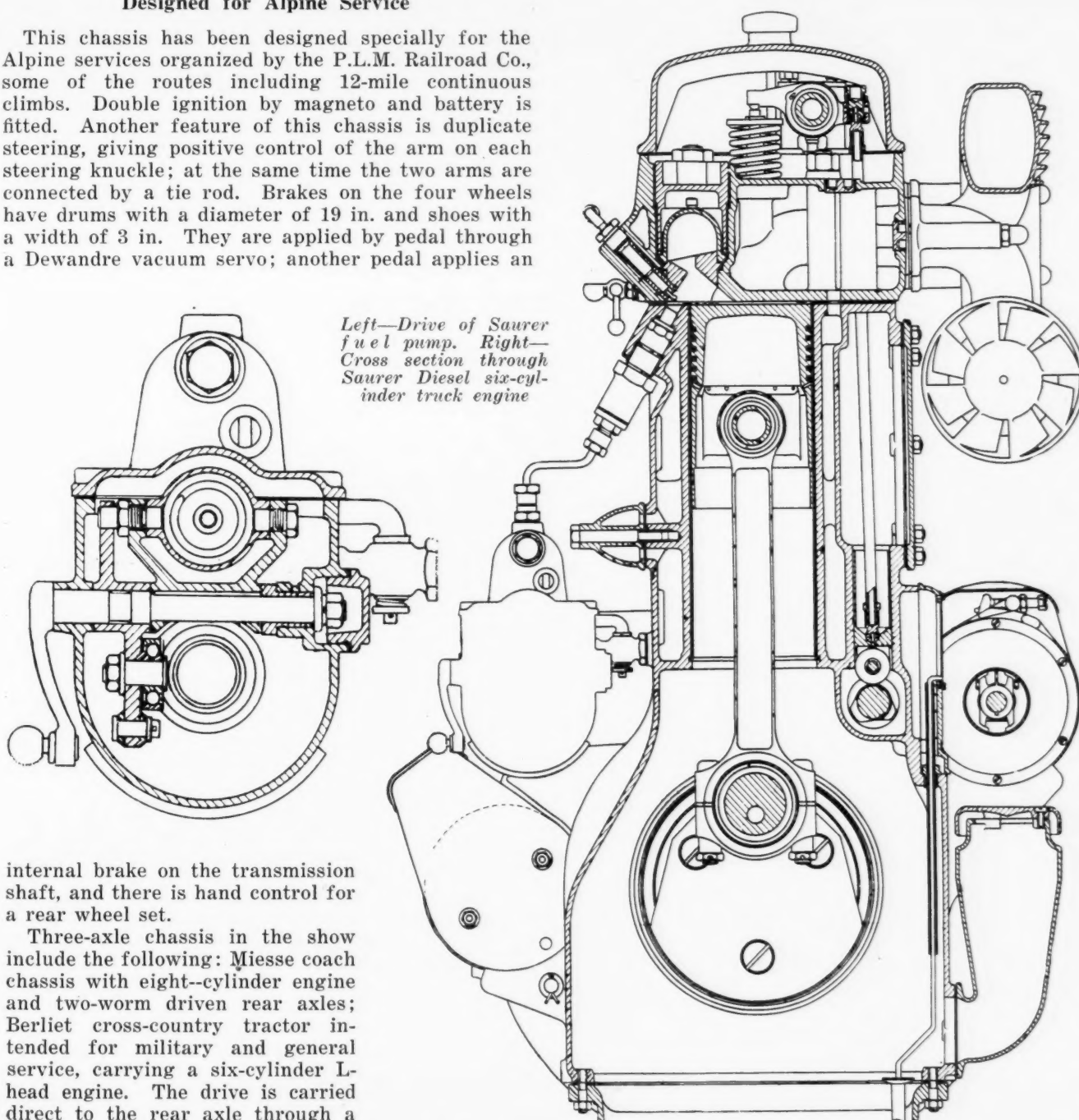
latter model is carried in a drop frame coach chassis with double reduction rear axle.

Berliet is out with two new sixes, one of which is in a six-wheel coach chassis. Another new six for a high speed coach chassis is shown by Latil. One of the features of the side-valve six on the new Cottin & Desgouttes coach chassis is the use of two independent oil pumps, working at the same pressure and maintaining two distinct feeds to main bearings, connecting rods, camshaft and timing gear. On one of the oil pump shafts there is a second pump circulating the oil through a radiator below the water radiator.

Designed for Alpine Service

This chassis has been designed specially for the Alpine services organized by the P.L.M. Railroad Co., some of the routes including 12-mile continuous climbs. Double ignition by magneto and battery is fitted. Another feature of this chassis is duplicate steering, giving positive control of the arm on each steering knuckle; at the same time the two arms are connected by a tie rod. Brakes on the four wheels have drums with a diameter of 19 in. and shoes with a width of 3 in. They are applied by pedal through a Dewandre vacuum servo; another pedal applies an

four-speed transmission, a drive shaft with a second reduction gear on it, thus giving six speeds ahead, and finally a shaft contained within a torque tube. From the rear axle the drive is carried forward to the central and the front axles by longitudinal shafts and worm gearing. The front and rear wheels both serve for steering. Another Berliet six-wheeler has been produced specially for passenger service, and has two overhead worm rear axles carried on inverted semi-elliptic springs and united by a couple of tubular radius rods. Chenard & Walcker has a six-wheel tractor with the two rear axles driven by inclosed



internal brake on the transmission shaft, and there is hand control for a rear wheel set.

Three-axle chassis in the show include the following: Miesse coach chassis with eight-cylinder engine and two-worm driven rear axles; Berliet cross-country tractor intended for military and general service, carrying a six-cylinder L-head engine. The drive is carried direct to the rear axle through a

chains. This is equipped specially for forest work.

Renault is showing a six-wheel chassis of a type that has been in production for the past two years, and Berliet has a 10-ton truck chassis with three axles, the central axle being driven by chain and the rear axle being a trailer.

One of the features of the show is the appearance of the Saurer six-cylinder Diesel. This is so designed that the main elements can be used equally well for a gasoline engine. The necessary rigidity for the Diesel cycle has been secured by casting the cylinders and the crankcase in one piece, and by mounting the assembled seven-bearing crankshaft on roller bearings in a crankcase tunnel. The valves are vertical in the head and are operated by pushrods and rockers, the timing being exactly the same whether the engine is used as a gasoline or a heavy oil model. The cylinder head for the Diesel is quite special, and gives

a volumetric compression ratio of 15.5 to 1, or a theoretical compression of 35 atmospheres. The maximum compression at combustion according to whether injection is retarded or advanced, is from 470 to 620 lb. p. sq. in., which gives a temperature at the end of compression of about 930 deg. Fahr. This is quite sufficient to effect auto ignition of the gas oil.

The air, which is drawn in on the induction stroke, is compressed into a spherical ante-chamber having a bottle neck. This chamber is screwed into the head and is not water cooled. Fuel is injected into the ante-chamber from a Bosch pump in the same direction as the flow of the air, and not in the contrary direction as on many Diesel engines, and begins 15 deg. before upper dead center. Experiments have proved that combustion takes place in the venturi tube forming the mouth of the ante-chamber, and not in the chamber itself. The temperature of the uncooled ante-chamber does not exceed 750 deg. Fahr., while the temperature at the mouth of the chamber, where combustion takes place, is not less than 3090 deg. Fahr. At full load the temperature of the exhaust is slightly less than that of a gasoline engine, being about 1110 deg. Fahr. At reduced loads it is considerably lower, for the full volume of air at one atmosphere is used to burn the infinitely small quantity of gas oil.

The engine, which has a bore and stroke of 4.33 by 5.90 in., develops 83 hp. at 1600 r.p.m., and consumes 0.46 to 0.51 lb. of gas oil per horsepower-hour. All kinds of gas oil can be used, and a saving on fuel cost of 80 per cent is claimed. The lubricating oil consumption on the Diesel is said to be exactly the same as on the gasoline model and there is no crankcase dilution. The Diesel engine allows the throttling down to a degree not possible with the gasoline model, and it is particularly efficient at partial throttle openings.

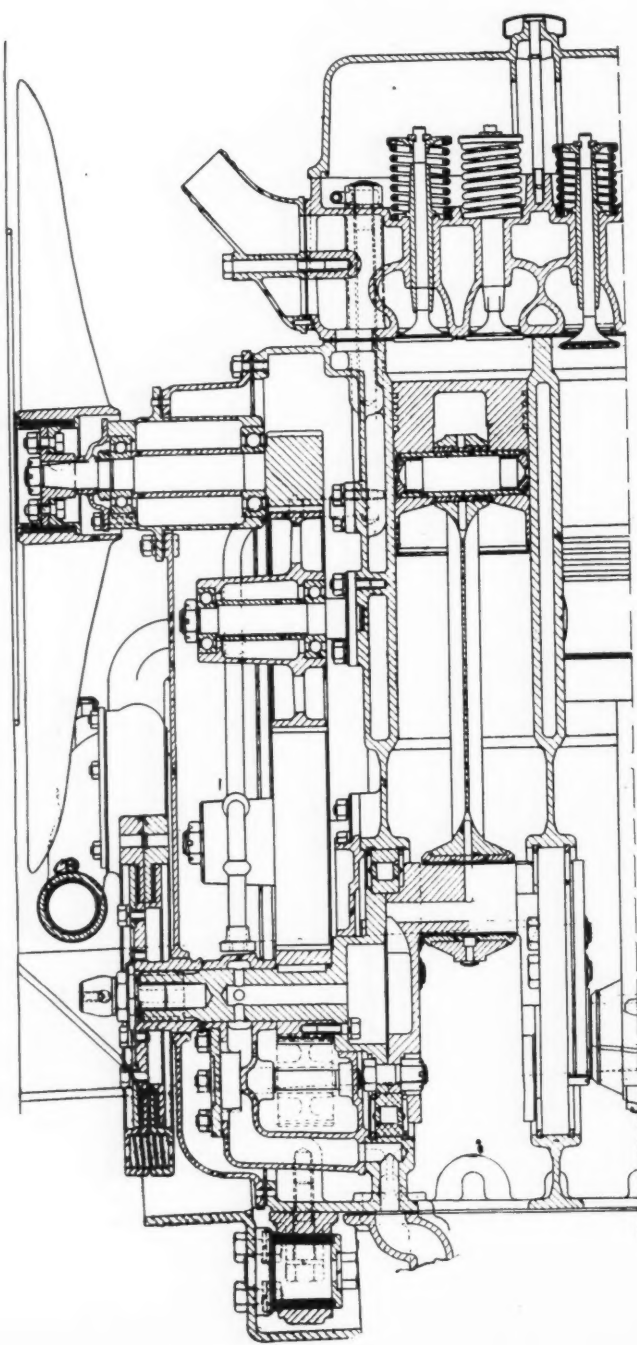
Weight is the Same

Total weight is exactly the same on the two types. To facilitate starting from cold a platinum point in the mouth of the combustion chamber is heated electrically for about 30 seconds. The Diesel engine is mounted in a 6-ton chassis.

The only other Diesel engine in the show is exhibited by the Peugeot Co. and is a twin-cylinder, double-piston, two-cycle type built under Junkers license. This engine is built by an auxiliary of the Peugeot Co. at Lille and is being supplied to other truck manufacturers. In consequence it is being shown as an alternative at the booth of several truck makers, including the firm producing the American Liberty truck.

Important changes have been made in the creeper track used on the Citroen-Kegresse tractor. Originally this was an all-rubber construction, but it now consists of a thin endless band of rubber and canvas carrying a series of rectangular steel plates. Each plate is held in position on the band by three bolts, the center bolt being countersunk on a block of rubber in contact with the road and also holding a tongue of rubber on the inner face, which acts as a guide. The two lateral bolts each hold a small block of rubber engaging with slots cut in the face of the driving pulley, and thereby assuring a positive drive. The band retains all its original flexibility, but by reason of its armor plating and the detachable blocks of rubber it is more economical to produce and to maintain. It is claimed that this tractor has been adopted by the French military for hauling 75 mm. guns.

(Continued on page 837)



Longitudinal section of forward part of Saurer Diesel engine

Just Among Ourselves

Human Consideration of Personnel Problems

K. T. KELLER, Dodge's new general manager, made a statement in his talk to the S.A.E. recently which 12 or 15 years ago would have been revolutionary in character and probably would have caused widespread argument, but which today is accepted without a ripple of surprise. "The day of getting lower production costs by reducing the earnings of employees," he said, "is past." Then he went on to show the various other ways in which future manufacturing economies probably would be obtained. That an important executive can make such a statement and have no opposing executive voice cry "No" seems to us to be one of the really practical indications of the entirely human consideration which is being given to most of our automotive personnel problems today.

* * *

Processing Advances Faster Than Assembly

KELLER said a lot of other interesting things in that same talk, most of which we haven't space at the moment to discuss. We were specially interested, however, in what he said about the relative efficiency of processing as compared to assembly methods in automotive manufacturing. Quality, he believes, has progressed much further than that of assembly. This is due, he says, to the fact that we have been able to borrow much more from other industries as regards processing methods and practices. He also indicated his belief that considerably more development is probable in the next 12 months in the work of car painting and pointed out that factory layout men should know more than they do on the aver-

age about the details of the machines and methods for which they are working up layouts. Coming from the source that they did these beliefs carry considerable significance.

* * *

Quick Selling Lines Demanded by Jobber

HEARDED an interesting story the other day about an automotive jobber out in the Middle West who is said to make about 7 per cent net almost every year on his operations. He claims that the secret of his success lies in adherence to one principle—according to our second-hand information—and that one principle is, "Never take on any line that it takes one of your salesmen more than 30 minutes to sell." Like most generalizations this one seems to us to have serious faults, but it does appeal to us as containing a thought worth cogitating on for manufacturers designing and producing items for marketing to the automotive retail and replacement trade.

* * *

Bargain Sale Idea Reducing Car Stocks

THIS has been a banner year, automotively speaking, in many ways, but the one that pleases us most is that the industry seems finally to have come pretty definitely to adoption of the bargain sale idea on old merchandise which has worked successfully for so many years in many other lines of business. Packard, Dodge, Pontiac and others this fall have frankly cut prices on existing stocks and announced those cuts as being due to the imminence of new models. So far as we have been able to determine the policy has been working successfully, too.

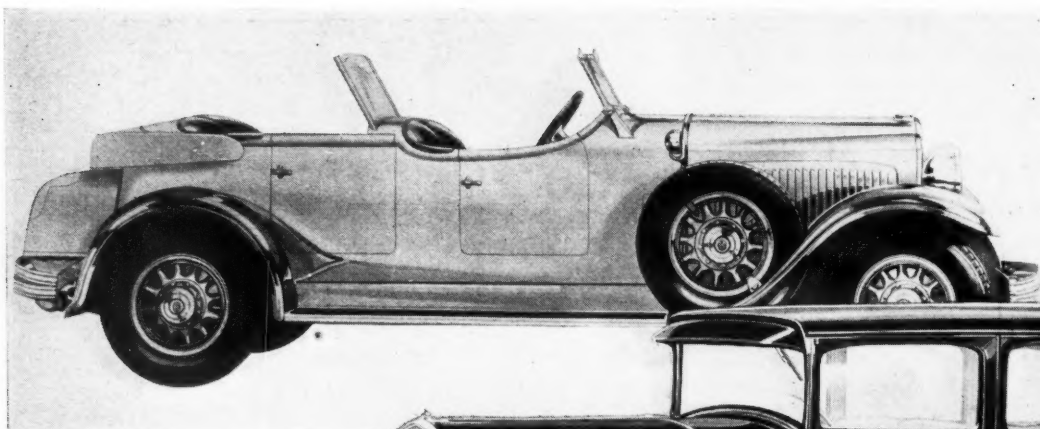
U. S. Taking Lead in Commercial Flying

ONLY a few years back there was a good bit of calamity howling about how Europe was getting a head start on Uncle Sam in the way of commercial aviation and how we were going to have a hard time ever to catch up again. Haven't heard much worrying on that score lately. Looks as though the same cycle were taking place as that which occurred some 25 years ago as regards automobile development. The Europeans got started in automobile production and design before we did, but once our crowd got under way they took the play away from Europe rather definitely. Something of the same thing seems to be taking place in aviation, although we cannot yet be said to have outstripped Europe entirely by a long shot. Heard the other day, however, that there are now 7500 miles of lighted airways in the United States as against a total of about 2000 miles in all the rest of the world.

* * *

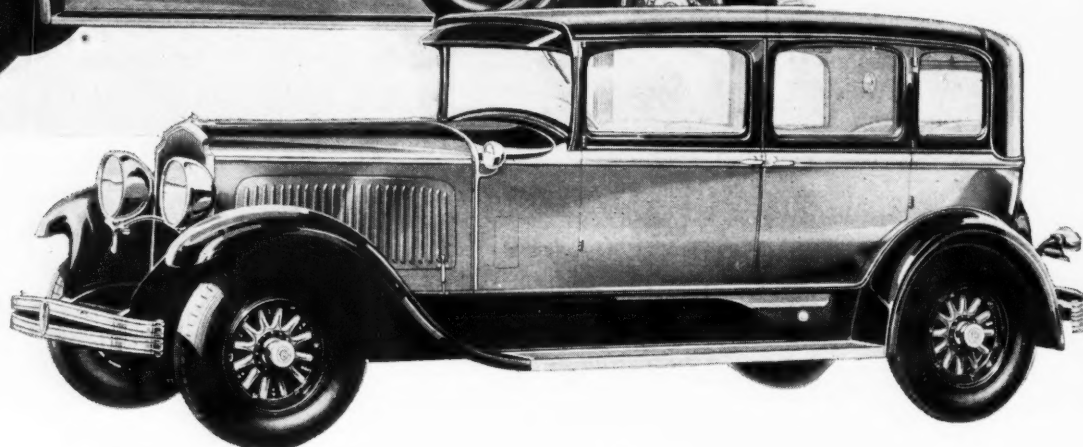
Airplane Production Capacity Excessive

SEEMS to be no doubt of the soundness of the future of the commercial aviation industry in this country from now on. There does seem to be a very considerable doubt, however, as to whether that progress is going to be as rapid and as spectacular from a volume standpoint as the man in the street might be led to believe from a view of the financial and factory operations being planned and executed at the moment. Even at this early stage in its development the airplane business seems already to have reached a point where production capacity exceeds probable consumption of planes by quite a large percentage.—N.G.S.



Left — Chrysler
Imperial sport
phaeton

Right—New Im-
perial five-passen-
ger sedan



Chrysler Announces *Body* Changes on *Imperial* Model

Radiator treatment reminiscent of "75" style. Standard compression ratio is lower. "Decarbonizer" on engine.

By A. F. Denham

BELIEVING in the preponderant importance of style appeal in higher-priced lines of motor cars, the Chrysler Corp., in announcing the new Imperial Chrysler, has confined its attention chiefly to body design. Nine body styles comprise the line. Three of these are by Locke & Co., viz., a convertible coupe, a convertible sedan and a sport phaeton. Prices for the various models are as follows:

Model	New Price	Old Price
2-4 Passenger roadster...	\$2,675	\$2,795
4-Passenger sport phaeton	2,675 (new)	
Standard coupe	2,895 (new)	
5-Passenger sedan	2,975	2,945
5-Passenger town sedan..	2,975	2,995
Convertible coupe	2,995 (new)	
7-Passenger phaeton	3,095 (new)	
7-Passenger sedan	3,095	3,075
7-Passenger sedan limousine	3,475	3,495

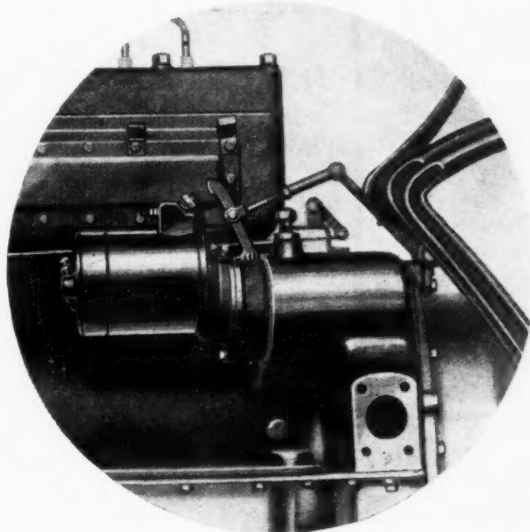
The front end of the car represents an interesting adaptation of the radiator design recently developed for the Chrysler "75" to the fluted shell and hood of the Imperial. The general outline of the former model is thus retained but the massive frontal effect found on the 75 is duplicated here. Similarly, the hood overlaps the radiator core, giving it a longer appearance. Hood louvres, as in other Chrysler models, are set in a panel as shown on the accompanying photographs. Further body features in which the Imperial resembles other Chrysler lines include the arched windows,



Front compartment of Chrysler Imperial sedan
with driver's seat in forward position

head lamp tie-rods, general molding treatment, etc.

Mechanically only few changes have been made. Last year a 6 to 1 "Red head" cylinder head was standard, and a 5 to 1 head was optional. On the 1929 models the reverse is true. With the silver-dome head



Partial view of engine, showing new starter engagement

the maximum hp. is 100; with the high compression head it is 112. Starter engagement is now by means of a manual shift. The tire size is now 7.00/18, as against the former 30 by 6.75. A new steel called "CNS" is used for the exhaust valves.

A featured item on the cars is a "decarbonizer." A small container is mounted on the front of the dash and is piped to the intake ports. A plunger located on the rear of the dash, when depressed, injects a small amount of "carbosalve" into the intake ports. This fluid is said to loosen carbon deposit if allowed to stand several hours. When the engine is started up the carbon is blown out by the exhaust gas.

Practically the only change in the chassis itself is the lengthening of the lower bushings in the front axle ends to make them longer than the upper bushings, actual lengths being $1\frac{5}{8}$ and $1\frac{3}{8}$ in., the diameters of both being 1 in.

Convertible Sedan

Of the various body models the most interesting is the convertible sedan by Locke. In this model front door windows, as usual, are concealed in the doors. Rear door windows open with the doors, but these, with a small center glass between front and rear doors, can be swung across the back of the front seat, thus forming a tonneau windshield which can be lowered into the back of this seat if so desired. This design greatly reduces the number of parts which have to be removed when converting a sedan to an open car. A crank-operated tonneau windshield is also standard in the Locke sport phaeton, which has rather unusual body lines. It combines the smartness of the roadster with the comforts and protection of the standard phaeton.

Interiors of all cars are of a custom character. Driver's seats on all closed models have adjustable backs. Sedans have folding center rests, running board lights, and de luxe interior fittings. Shatter-proof glass is used on all models for all windows. Front body pillars have been made narrower by using

steel forgings for this part, which has improved the vision. Cowl ventilators are of the flush kick type. Houdaille shock absorbers are now standard equipment. The equipment includes the new automatic radiator shutters, in addition to all items formerly carried.

A point of interest on the rumble seat models is the provision of a door for access to the rear compartment on the curb side of the body.

Paris Truck Show

(Continued from page 834)

Producer gas plants show no further development. These are being marketed by Renault, Berliet, De Dion-Bouton, Dewald, Panhard & Levassor and Liberty.

In body construction the greatest attention has been paid to the coach type carrying from 18 to 24 passengers. This is a touring class of business most developed in the mountains, and calls for a body with a high degree of luxury. The general arrangement is a front entrance, just behind the driver's seat, with a central gangway and two seats on each side of it. Sunshine roofs, which by means of crank mechanism and chain can be drawn back or closed up completely, are becoming numerous. As distances are increasing the problem has to be faced of carrying baggage on these vehicles, but developments do not show a great deal of originality. A few coaches are displayed with baggage lockers under the body, the full width of the vehicle. On a 24-passenger coach built for the American Express Company's service in France the four rear seats are separated from the rest of the body by a demountable wood partition. On long distance trips the seats are taken out of this compartment and baggage is carried in it, the passenger capacity thus being reduced to 20. For local service the partition is removed and the full capacity of 24 passengers is secured.

Many of these single deck coaches are now fitted with a lavatory at the rear. Usually, in this case, they have a rear entrance in addition to the front entrance giving access to the central gangway. Fabric leather coach bodies, which were numerous a couple of years ago, have practically disappeared.

TESTS on the visibility of the light from a neon lamp as compared with that from an ordinary incandescent lamp were made by members of the Bureau of Standards at Moody Point, Me. The ability of rays from an incandescent lamp with a red color screen to penetrate fog, as compared with rays from an ordinary unscreened incandescent lamp, was also put to a test. These tests, while made chiefly with a view to the requirements of airway lighting, are of interest also from the standpoint of automobile lighting.

No differences, sufficiently great to be detected by the methods used in the tests were found between the visibility of light from a neon lamp and light of the same color, candlepower, and horizontal distribution produced by an incandescent filament lamp with color screen.

With regard to the comparison of the clear incandescent lamp and incandescent lamp with red color screen, the red filter does not increase the range under any weather conditions, but there is some evidence that the red filter does not reduce the range as much in foggy weather as it does in clear weather.



Above—Whippet Six coach. Wider doors afford easy entrance and exit. Right—Seats of the redesigned Whippet Fours and Sixes are contoured for maximum comfort

Both lines have increased power, stronger frames, longer wheelbases and new bodies. "Finger-tip" control is feature. Prices remain on same level as before.

MORE power, a stronger frame, a longer wheelbase and more attractive bodies characterize the new Whippet Four and Whippet Six lines announced by Willys-Overland, Inc. On the closed body types prices either remain the same or have been reduced, while there have been both increases and decreases in price on open models. Following is a complete list of body models with old as well as new prices:

Body Model	Four		Six	
	Old Price	New Price	Old Price	New Price
2-p. Roadster	\$525	\$485	\$685	None
2-4-p. De Luxe Roadster .....	...	...	None	\$850
5-p. Touring	455	475	615	635
2-door Coach	535	535	695	695
5-p. Sedan	610	595	770	760
2-p. Coupe	535	535	695	695

While a number of mechanical refinements have been made in both chassis, the major part of the developmental work represented by the new Whippets is found in the new bodies. The accompanying illustrations hardly do the cars justice, as they were reproduced from wooden dummies.

On the four-cylinder Whippet the piston stroke has been increased from $4\frac{3}{8}$ to $4\frac{3}{4}$ in. This resulted in an increase in the piston displacement from 134.2 to 145.7 cu. in., and the increase in displacement together with an increase in the compression ratio to 5.4 to 1 is said to have resulted in increasing the maximum horsepower to around 40.

To make it possible to use the same cylinder block in spite of the increased length of stroke, the connecting-rod center-to-center length was reduced from $9\frac{3}{8}$ to $9\frac{3}{16}$ in. The former cast-iron pistons were replaced with aluminum alloy invar-strut pistons, to reduce engine vibration due to inertia forces. Each piston is

fitted with two $\frac{1}{8}$ -in. compression rings and one $\frac{5}{32}$ -in. oil wiper ring.

A further change which is said to have contributed to the increased power in the Whippet Four is the adoption of a new model Tillotson S-4d carburetor of the plain tube type with 1-in. throat. Better muffling has been obtained by leading the exhaust down at the front of the block, this also contributing toward keeping heat and fumes away from the body interiors. The cooling water capacity has been increased slightly, to $2\frac{7}{8}$ gal. The rear axle ratio is now 4.56 to 1, as compared with 4.87 to 1 formerly. This reduction, which was made possible by the increase in engine power, will give a higher top speed and a higher car speed for a given engine speed throughout the range.

Higher Steering Gear Ratio

The steering gear ratio is now 11 to 1, which is higher than it was last year, the change having been made for the sake of easier control. Perhaps most important among chassis changes is an increase of 3 in. in the length of wheelbase. This increase in length has been made use of to improve the appearance of the car, rather than to increase the body space, for the interior body dimensions remain substantially the same.

This increase in the length of wheelbase, which was made in the Whippet Six as well, was accompanied by a rather sweeping redesign of the frame, which now has some quite novel features. For instance, there is a widening out of the bottom flange of the side member at both front and rear. At the rear this extension is bent over slightly and riveted to the plate-type cross-member over the gasoline tank, which latter is riveted also to the top flange. In addition there is a tubular cross-member at the rear, hence the rear portion of

Four and Six Redesigned

the frame is considerably stiffened.

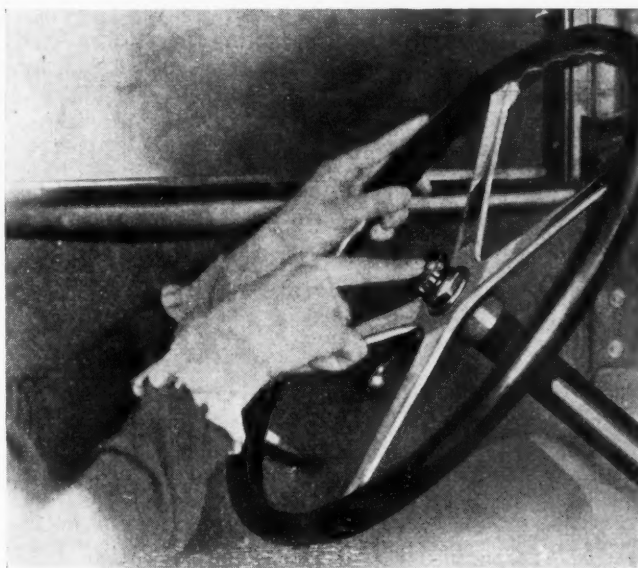
At the radiator cross-member of the frame the lower flange is extended in the same way, to form a box-section with the strip-steel cross-member. A further interesting reversion to earlier design is found in the mounting of the radiator through brackets on the frame side rails instead of on the front cross-member. This should also make it easier to remove this unit. Another item of interest is the single bracket on each side rail which supports both brake cross-shafts. Center supporting brackets are simple pressed steel angle brackets riveted to the cross-member immediately above the rods.

Aside from the steering gear, wheelbase and frame changes described above, which are also found on the Whippet Six, the latter has practically no mechanical changes. A slight increase has been made in the compression ratio, which is now 5.1 to 1, and the engine now is rated at 50 hp.

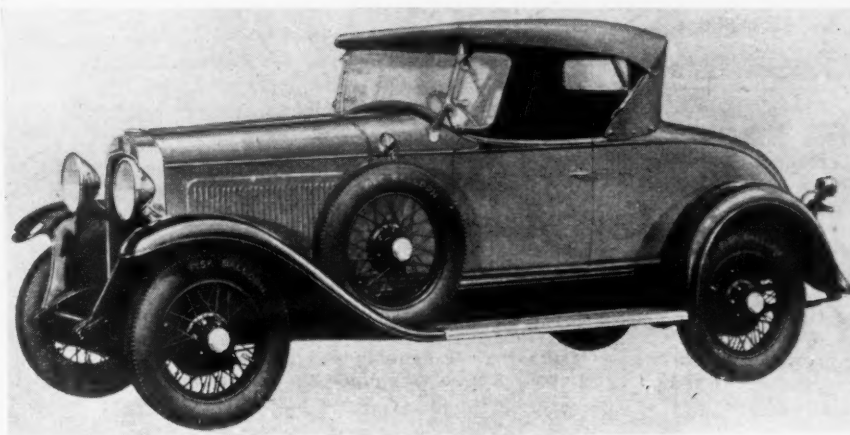
"Finger-Tip" Control

A feature of both cars is the so-called finger-tip control. This consists of a button in the center of the steering wheel in which are centralized all electrical connections aside from the Electrolock ignition switch. Pulling out the button operates the starter switch. Pushing it in sounds the horn, and turning it to the left or right operates the lighting, including the new twin-filament-bulb Twi-Lite headlamps. These have 10½-in. lenses.

Other new features on the cars include Monocontrol



A feature of the new Whippet models is the "finger-tip" control. Pulling out the button on the center of the steering wheel operates the starter. Pushing it in sounds the horn. Turning it to right or left operates the lights



New Superior Whippet Six roadster

(crank-operated) swinging windshields, polychrome finish instrument panels, more profuse use of chrome plating for exterior hardware, and right-hand fender well mounting for spare rim and tire for open and coupe models.

New York Salon

(Continued from page 825)

forth a proportionate increase in the use of leather upholstery, which was also used on some closed bodies.

An interesting detail noted in a Fleetwood body was the provision of an armrest for front seat passengers which should be very convenient for the driver, at least. Considerable attention has been given to making the various accessories required to complete the interior of a car less conspicuous and in place of having them scattered all over the interior a number of makers have collected them into a single group, frequently attached to the back of the front seat and covered, when not in use, by panels.

With the same objective in view, that of simplifying the appearance and making the necessary units less conspicuous, some makers, particularly noticeable on Isotta-Fraschini bodies, have provided aprons over the spring horns to conceal frame ends, springs, starter crank hole and the other items which make the front of the average car look so complicated.

The Fleetwood and Fisher displays feature color schemes which have been taken from some of the famous paintings of the world, including deVinci's "Mona Lisa," Gainsborough's "Blue Boy," Titian's "Flora" and others. Just one model, a Fleetwood-Cadillac cabriolet, was finished in aluminum, black and copper color scheme with snake skin upholstery.

Typical of the results achieved by this method may be cited a LaSalle sport roadster by Fleetwood colored after Frans Hal's "The Laughing Cavalier." The hood and cowl are finished in green; the lower body, fenders and running gear in deep maroon and the six wire wheels, rear deck and body above the molding in brown. Roof and rear quarters are done in tan Burbank silk mohair with Bedford cord lining to match the exterior of the rear deck. Body moldings are in gold leaf.

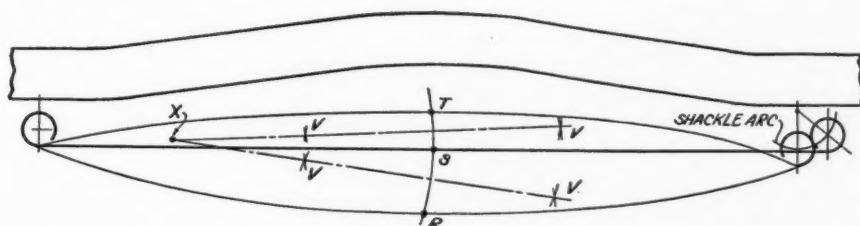


Fig. 4—To use the diagrams as dummies on a chassis layout of spring eye and shackle limits. Performing a separate operation for full load bumper and rebound positions, lay the spring dummy on the layout with one eye on the fixed point and the other on the shackle arc. Lay the second dummy on top of this one with the tube centerline through the universal joint center. Prick punch through the centers (R, S and T) of the parts whose orbits are wanted. Using these punches as centers, and with any convenient radius, scribe arcs V. Converging lines through these arcs will meet at X. With X as a center scribe an arc that passes through R, S, and T. This arc is the orbit of the part whose movement is caused by the deflection of the spring, and its center X is the best position for the fixed end of a radius rod or the eye of a brake idler lever

spring and shackle limits. After prick punching through the interesting parts in all positions, a connecting arc through these points gives the desired orbit.

Any part that is fastened to a spring whose action is free, such as a conventional front end or a Hotchkiss rear, has the same amount of slip and the same angular movement as the top leaf of the spring; while any part that is fastened to a spring whose action is modified by a torque tube or arm has the same amount of slip as the top leaf of the spring and the same angular movement as the torque tube.

Let us assume a spring in the loaded position, with the bumper and rebound limits known (the rebound limit is the deflection caused by the application of twice the unsprung weight). If it has camber under full load, it is drawn in a diagram as in Fig. 2. to lay it flat, and then it is drawn according to Fig. 3 to the bumper and rebound limits.

For a spring whose action is free, add to the diagram the parts whose orbits are wanted.

For a spring whose action is modified, make an additional diagram to use in connection with the first one, showing the torque tube centerline and the parts whose orbits are wanted.

For a free action spring, using the diagram as a dummy, or for a modified action spring, using both diagrams as dummies (keeping the torque tube centerline through the universal joint center at all times), on a chassis layout of spring and shackle limits, prick punch through the centers of the parts whose orbits are wanted. A connecting arc through these points according to Fig. 4 gives the desired orbit, and the center of this orbit is the best "no walk" position.

Ward LaFrance Truck

THE Ward LaFrance Truck Corp., Elmira, N. Y., recently announced the introduction of a new 2-ton truck chassis, Model 2 RG, equipped with a six-cylinder engine, four-speed transmission and Lockheed four-wheel hydraulic brakes. It has the lines, equipment and finish of a passenger car, but the chassis is of heavy-duty construction. It is offered in three wheelbases, 161 $\frac{1}{4}$, 176 $\frac{1}{2}$, and 191 $\frac{1}{2}$ in. for 10, 12, and 14 ft. bodies.

The 3 $\frac{3}{4}$ by 4 $\frac{1}{2}$ in. six-cylinder engine develops 65 hp. at 2200 r.p.m. It is equipped with an oil filter and an air cleaner and is suspended by rubber shackles at three points. Mounted in unit with the engine is a multiple dry disk clutch and four-speed transmission. Final drive is through a Timken bevel-type rear axle with a standard gear ratio of 5 6/7 to 1.

Braking equipment includes a Lockheed four-wheel hydraulic brake and a hand brake mounted behind the transmission. Steering is through a Ross cam-and-lever gear. The walnut-finished steering wheel is equipped with a sunken spark control, lighting control and horn button.

Four semi-elliptic springs support the frame, which is of 6 in. channel, reinforced with gusset plates. Budd disk wheels are fitted and carry 32 by 6 in. pneumatics, singles in front and duals in the rear.

The radiator has a pressed steel chromium-plated shell and the cowl is designed to conform to the radiator, providing unbroken lines from the radiator to the back of the cab. The cowl is separate from the cab and is equipped with chromium-plated molding and cowl lamps. The cab is of the sedan type, with curved lines in both horizontal and vertical planes. Doors are full height and hinged at four points.

Standard equipment includes an electric generator, a heater, a spare wheel, a front bumper, chromium-plated headlamps with double-filament bulbs, a stop-light and a chromium-plated instrument board which carries the ignition switch and choke and has a speedometer, an ammeter, an oil gage, a thermometer and a gasoline gage mounted on a panel under glass.

IN his presidential address to the Institution of Civil Engineers Sir Brodie Haldane Henderson spoke on road conditions in the United Kingdom. He pointed out that today there are about 180,000 miles of roads in Great Britain, of which 25,000 miles are Class 1. Road capacity cannot be judged simply by mileage. Alignment, width, condition of surface, and, among other factors, the type of vehicle, all contribute to the capacity. It is certain that the number of vehicles using the roads will go on increasing. The traffic statistics show that on 11 selected roads the average number of vehicles passing daily had increased in 1926 by 125 per cent over the figures for the years immediately preceding the war; and on one of those roads the increase was as much as 700 per cent.

"The future of the roads is an interesting question to dwell upon. Are they to go on ever increasing in mileage and tonnage carried, or is the point of saturation approaching, when the railways will relieve the roads, giving them again a rest, as happened at the advent of the railways? Perhaps the most probable outcome is that we shall find that both are needed," Sir Brodie said.

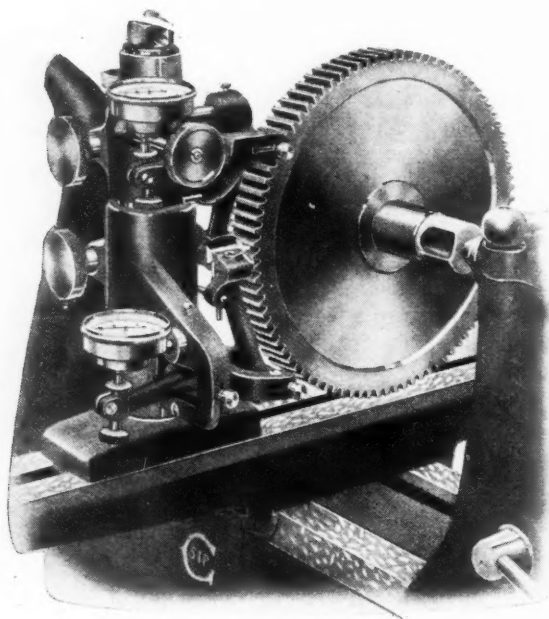
FLIGHT-LIEUTENANT D'ARCY GREIG of the British Air Service on Nov. 4 made an attempt on the airplane speed record, which has been held in Italy by Major de Bernardi for nearly a year. He achieved a mean speed of 319.17 m.p.h., which is better than the present world's record, 318.4 m.p.h., but will not be recognized as a new record because the rules stipulate that in order to break the record it must be exceeded by at least 5 m.p.h. During his fastest lap Lieutenant Greig's speed was 322.63 m.p.h.

NEW DEVELOPMENTS—Automotive

Gear Testing Apparatus

THE Societe Genevoise, through its American agent, the R. Y. Ferner Co., Investment Bldg., Washington, D. C., is marketing the Sip gear testing apparatus which is designed to give complete information regarding various type of gears.

For spur gears the device provides a measurement of the profile of the teeth, of the eccentricity of the teeth with regard to the bore and of the uniformity of the pitch; for bevel gears it measures the eccentricity



Sip gear testing apparatus, a product of the Societe Genevoise

and the uniformity of pitch, while for helical gears the device measures the profile, the eccentricity and the uniformity of pitch.

The bed of the apparatus is provided with a hinge joint to be fixed on a table or bench, permitting the instrument to be used either in the vertical or horizontal position. The gears to be tested are mounted on very accurate concentric arbors which are fixed between the adjustable centers of the apparatus. Two dial indicators are provided which read directly to 0.0005 in. and which permit estimating to half ten-thousandths.

Each of these dial indicators is operated by a lever fitted with a feeler engaging in the teeth to be tested. One lever transmits to its dial indicator radial displacements of the feelers, so the indicator measures eccentricity of the teeth with regard to the bore of the gear. The other lever transmits tangential displacements of the feelers to the other indicator which, therefore, measures the uniformity of pitch between two consecutive teeth.

For measuring tooth profile

the gear is fitted on an arbor with a plain disk the diameter of which equals the pitch diameter of the gear. A rack meshes with the gear, whereas the plain disk drives by friction a straight bar pressed against its circumference. The rack and bar are parallel.

When revolving the arbor the gear shifts the rack and the plain disk simultaneously drives the bar. If the tested profile of the tooth is theoretically correct then the movement of the rack and bar must be equal. Practically, this is measured by means of a dial indicator which, if it remains motionless on the whole contact, shows that the profile is perfect. Displacements of the pointer show in absolute value the errors in the profile of the teeth.

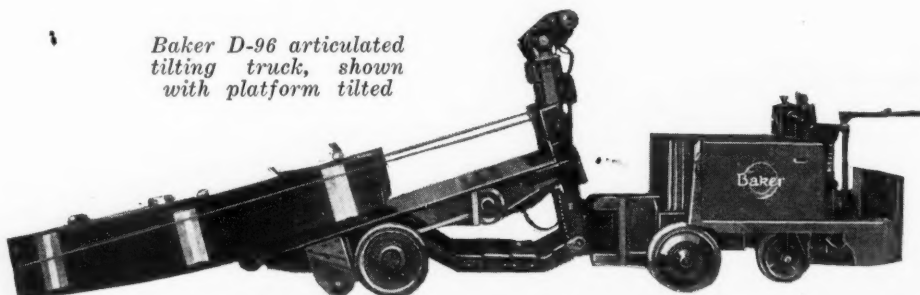
Articulated Tilting Truck

BAKER-RAULANG CO., Cleveland, Ohio, has perfected an electric storage battery truck which will load 10-ton packages of sheet steel into box cars without breaking through car floors. The handling of steel sheets has always been a problem. The sheets have had to be handled singly, or three or four at a time by hand. It is a tedious and expensive process and often results in scratching the polished sheets which are used for automobile body work. These scratches must be polished off before the body is finished, increasing the manufacturing cost.

The new truck, known as the Baker Type D-96 articulated tilting truck, is rather unique in its design in that it is articulated, or hinged, in the center. This hinge enables it to make the very short turn from the loading dock through a 6-ft. car door with a package as large as 48 in. wide and 102 in. long. In operation this truck is like a one-horse wagon, if the horse were turned around in the shafts and faced the wagon. The power section carries the battery and the driving and steering apparatus. The load section consists of a tilting platform mounted on a single axle and includes the hoist for tilting the platform and a double drum power winch.

Sheets which are to be handled by the truck should be provided with 2 x 4 wood skids and firmly strapped together. The truck will pick such a package up from the floor, but in order to handle the maximum tonnage it is recommended that the packages be placed on the truck platform by means of an overhead crane. The steel is usually weighed just before it is loaded, and when the crane picks it up from the scale the truck platform is run underneath. The truck then carries

Baker D-96 articulated tilting truck, shown with platform tilted



Parts, Accessories and Production Tools

the load from the scale and places it in the car. Under such conditions, and making ample allowances for delays, the truck will load approximately 500 tons of sheet in a 10-hour day, putting a package weighing from 6 to 10 tons into a car in from 10 to 12 minutes. In tests, packages have been repeatedly loaded into cars within 6 minutes, but in regular operation, it is estimated, delays and other contingencies will merely double this minimum time.

Under the present system, two men will load approximately 80 tons of sheet per day by hand. Accordingly, this truck, with an operator and a helper, will replace 12 men and will eliminate all of the damage to the sheets as a result of scratching or rusting.

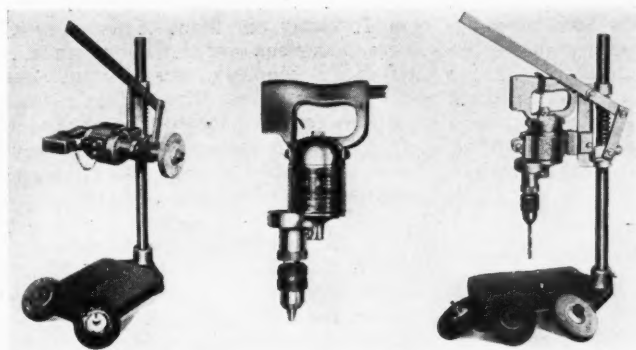
In operation the truck is driven into the car with the load ahead. The platform is tilted until the rollers and wheels are all in contact with the car floor, thereby distributing the load so that the floors will not break through. With the platform tilted the package is prevented from slipping by the winch cables. The truck now moves to the end of the car, and the package is allowed to slide from the platform, the operator slacking up on the winch cables. As soon as the package comes into contact with the car floor the truck brake is released and the cables are paid out further, the weight of the package sliding the truck out from under the load. Guide strips are then slipped under the package and nailed to the floor alongside the skids. These strips allow the package to slide freely lengthwise of the car but prevent its shifting sidewise. Sheets larger than 48 x 102 in. can be handled, but automobile cars with 10 ft. door widths are required.

This same truck may be used for unloading cars, the cables pulling the package up onto the truck platform. In case the consignee is not equipped with such a truck the straps can be cut and the steel unloaded by hand as at present.

Wodack Portable Drill

WODACK ELECTRIC TOOL CORP., 4627 West Huron St., Chicago, has brought out a $\frac{3}{8}$ -in. portable electric drill which is designed to meet the need for a very light drill in work of the nature such a tool can handle. The tool weighs only $7\frac{1}{2}$ lb. and, in addition to drilling, can be used for odd grinding and buffing jobs.

It is powered with a G.E. universal motor and is



Wodack portable drill, grinder and buffer with stand

fitted with a trigger switch. A stand for holding the drill vertically for drilling and horizontally for grinding and buffing can be furnished.

Vertical Broaching Machine

AERICAN BROACH & MACHINE CO., Ann Arbor, Mich., has developed a 2-ton vertical broaching machine which was originally designed for broaching new and rebabbitted connecting rods but which has a wide range of usefulness in other fields.

The machine is self-contained and is operated by oil pressure, oil pump and reservoir being part of the equipment. The stroke is $14\frac{1}{2}$ in. with a ram diameter of 2 in. and the end of the ram is tapped out $\frac{3}{4}$ in.-16 to receive attachments for pushing. The table surface is 8 in. diameter and work up to $10\frac{1}{4}$ can be handled. Either hand or foot operation is possible.

The design of the oil system makes the return stroke of the ram about 25 per cent faster than the working stroke. The pump is of the continuous flow type and a balanced piston valve controls the action of the ram. The maximum capacity of the pump is 400 lb. per sq. in. and a relief valve is provided which may be set to any value up to maximum.

The machine can be furnished as a bench type or with pedestal and floor pan, as is recommended by the makers. When belted so that the drive pulley operates at 600 r.p.m., the working speed of the ram is 14 ft. per minute. Drive pulley speeds as high as 1200 r.p.m. can be used, increasing the ram speed in proportion.



American Broach & Machine Co. 2-ton vertical broach

Bracke Carburetor

IN the article on the Bracke carburetor in our issue of Nov. 10, several unfortunate errors occurred. The venturi tube was given the reference number 20 in the text while in the illustration it was indicated by 9. Also, in the photograph of the carburetor the passages shown sectioned are the economizer passages and not the accelerator passages.



News of the Industry

PAGE 844

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NUMBER 23

Factories Hold Operations at High Late Year Rate

PHILADELPHIA, Dec. 8—Manufacturing operations in the automotive industry will continue at a fairly steady rate through December. Increasing operations in some plants which have been making manufacturing changes for new 1929 models will be partly offset by decreasing operations in other plants which have been at capacity operation for the past several months.

The retail market throughout the country, though consistently better for the season than in recent years, is declining from the high pressure buying pace of the early fall, but new car stocks in dealers' hands are in good condition and factories generally are curtailing shipments to prevent accumulation of stocks beyond normal requirements. Several manufacturers, notably Ford and some higher priced car makers, are meeting a continuingly strong retail demand by retaining practically capacity operation.

That public interest in automobiles is as strong as ever is indicated by record attendances at recent showings of new cars. This attendance has been accompanied by the placing of much retail business for delivery after Jan. 1, a circumstance which will have the effect of building up a large retail sales volume during December which will not be reflected in reports on the month's business.

Increased Ford Operations Reduce Back Order Bank

DETROIT, Dec. 6—The large bank of orders for Ford cars has been greatly reduced in recent weeks, so much so that dealers in some sections of the country are on a practically immediate delivery basis on some models. Conditions vary in different sections, some models being sold ahead in some territories while they are being delivered with little delay in others.

This results from two causes—the varying demand in the different territories and the rate of operations in the assembly plants serving the territories. Conditions vary with dealers in the same cities, some being oversold on models that other dealers can deliver quickly. Generally speaking, all models except the two-door sedan can be delivered within several weeks, this model being the most oversold, while the four-door sedan is most available.

Output in November Estimated 280,000

NEW YORK, Dec. 6—Production of cars and trucks in the United States and Canada for November totaled 280,000, according to preliminary estimates by the National Automobile Chamber of Commerce. This compares with 140,033 in November, last year. Output in the first 11 months totaled 4,368,700 as against 3,436,755 in the same period last year and against 4,328,234 in the 11 months' period of 1926, the industry's record year. A resolution of regret on the death of C. C. Coddington, president of the National Automobile Dealers Association, was passed by N.A.C.C. directors.

Hodgkins Joins Durant

NEW YORK, Dec. 8—R. T. Hodgkins has joined Durant Motors, Inc., in an executive sales capacity. Mr. Hodgkins recently was a vice-president of Federal Motor Truck Co. and previously was identified with Rickenbacker and with Studebaker.

Chevrolet Increases Showings

DETROIT, Dec. 4—Due to the tremendous interest which has been excited throughout the country to see the new Chevrolet Six, executives of the Chevrolet Motor Co. have altered original plans for 11 major advance showings of the car to include 50 additional advance showings in other important centers.

Stromberg Pays Stock Dividend

NEW YORK, Dec. 6—Stromberg Carburetor Co. has declared a stock dividend of 87½ per cent and a cash dividend of 75 cents as compared with 50 cents paid quarterly formerly.

11 Cities Sell 44,060 New Cars in October

COLUMBUS, Dec. 3—The Ohio Council of the National Automobile Dealers' Association in a tabulation of new car sales in 11 of the most important cities in the North, Middle West and Pacific Coast in October showed a total of 44,060. Sales in Indianapolis were 1214; Buffalo, 1888; Chicago, 6227; Detroit, 6693; Syracuse, 703; St. Louis, 2326; New York City, 11,098; Rochester, 1025; Los Angeles, 7776; Philadelphia, 2820, and Pittsburgh, 2290.

Salon Sales Exceed \$3,500,000 in Value

NEW YORK, Dec. 8—Prosperous business and financial conditions, especially in and about New York, are reflected in the sales record made at the annual salon. Tabulation of the reports of the various exhibitors for the first six days of the salon showed a total sales volume in excess of \$3,500,000 with every prospect that the final tabulation will show a total business of approximately \$4,000,000. New attendance records were also established.

Most of the exhibits at the New York salon will be shown in the forthcoming salons in Chicago, Los Angeles and San Francisco where it is anticipated that attendance and sales will rival the records just made.

Wilson Assistant to Sloan

NEW YORK, Dec. 5—Charles E. Wilson, formerly president of Delco-Remy Corp., has been appointed assistant to Alfred P. Sloan, Jr., president of General Motors Corp. Mr. Wilson's headquarters temporarily will be at Anderson, Ind. No announcement has been made as to who succeeds Mr. Wilson as president of Delco-Remy.

G.M. Has 71,185 Stockholders

NEW YORK, Dec. 6—General Motors Corp. common and preferred stockholders for the fourth quarter this year numbered 71,185 compared with 71,682 in the third quarter and with 66,209 in the final quarter last year.

Chicago Aero Show Displays All Types

Nearly All Makes of Planes
and Engines Shown—As-
sociations Hold Meetings

CHICAGO, Dec. 6—With nearly every make of commercial aircraft engine and plane whether in production or just about to be placed in production exhibited at the Coliseum, Chicago Aircraft Week proved to be a huge success. Coincidentally with the show various organizations such as the Society of Automotive Engineers, and the Aeronautical Chamber of Commerce held conventions here.

Prominent of the papers presented at the S.A.E. the first day were a discussion of in-line types of air-cooled engines by S. D. Herron of Wright Field and a paper on the advantages of Diesel engines for aircraft by Capt. L. M. Woolson of Packard.

There were many interesting new exhibits at the aircraft show. Worthy of special mention are the 1929 series of Wright Whirlwinds now available in three sizes of either five, seven or nine cylinders ranging from 150 to 300 hp.

A permanent committee headed by Phil Love of St. Louis was formed by the Aeronautical Chamber of Commerce to draw up a stringent code as a basis for distinguishing between accredited and non-accredited flying schools. The largest gathering of trimotored ships in history was found here when 14 Ford transports brought over foreign aviation experts to the show.

Col. Paul M. Henderson, vice-president and general manager of the National Air Transport, yesterday was elected president of the American Air Transport Association.

Viriot May Establish Silentbloc Plant Here

PARIS, Dec. 1—Charles A. Viriot, vice-president in charge of sales of the Repusseau Co., Paris, will sail Dec. 10 to attend the New York and Chicago shows. Mr. Viriot will proceed almost directly to Cleveland and Detroit to place orders for special machinery to equip the new Repusseau factory, just being completed in the suburbs of Paris to meet the growing demand.

It is stated that several automobile manufacturers at Detroit are in negotiation with the Repusseau company for the application of Silentbloc bushings to their cars, and it is probable that a factory will be erected in America in order to handle this business.

Mr. Viriot's address in the United States will be care of J. E. Bernard, 31 Bridge St., New York City.

G.M. Signs for Wire Wheels

DETROIT, Dec. 6—General Motors Corp. has signed a license agreement with the Wire Wheel Corp. of America for wire wheel sets on Chevrolet cars.



Ford European Head

Sir Percival Perry, K.B.E., chairman of the new \$35,000,000 British company which acquires Ford European interests.

Motor & Equipment Names Sales Development Body

NEW YORK, Dec. 5—The first regular meeting of the executive committee of the Motor & Equipment Association was held yesterday at Nela Park, Cleveland. A sales development committee was appointed, of which T. W. Whipple of Whipple's, Binghamton, was made chairman. M. C. DeWitt, vice-president of Champion Spark Plug Co., Toledo, is vice-chairman. Representing the manufacturing group on this committee are G. L. Brunner of Brunner Mfg. Co., Utica; W. G. Hancock of McCord Radiator & Mfg. Co., Detroit; George Fleming of George Fleming Machine Co., Worcester, Mass.; C. C. Gates of Gates Rubber Co., Denver, and S. B. Taylor of SKF Industries, New York.

This committee will have its first meeting on Dec. 17 in Chicago. It will cooperate with Neal G. Adair, sales development manager of the new association. Mr. Adair will have his headquarters in Chicago, from which this sales development work and the work of this committee will be conducted.

Autolite Declares Extra

DETROIT, Dec. 4—Electric Autolite Co., of Toledo, directors have declared an extra dividend of 50 cents on the common and regular dividends of \$1 on the common and \$1.75 on the preferred. All are payable Jan. 1 to stock of record Dec. 15.

Murray May Build in South

DETROIT, Dec. 5—Murray Corp. of America is considering the erection of a woodworking mill in the South, either at Memphis, Tenn., or Jackson, Miss. Definite decision on the matter will be made later.

Business in Brief

Written by the Guaranty Trust
Co., New York, exclusively for
AUTOMOTIVE INDUSTRIES.

NEW YORK, Dec. 6—Wholesale, retail, and jobbing trades have been stimulated by colder weather. The largest cotton mills in New England are running at capacity, which fact has greatly benefited retail trade in that section of the country.

MAIL ORDER SALES

Sales of two leading mail-order houses during November amounted to \$61,628,020, which marks an increase of \$10,371,336 over sales in the corresponding month last year. This increase is largely the result of new sales outlets recently developed.

PETROLEUM PRODUCTION

The average daily crude oil production for the week ended Nov. 24 totaled 2,505,000 bbl., which is 14,150 bbl. more than the figure for the preceding week and 106,650 bbl. above the average for the similar week last year.

FREIGHT CAR LOADINGS

Car loadings for the week ended Nov. 17 totaled 1,059,701 cars. This represents an increase of 6406 cars above loadings in the preceding week and an increase of 91,649 cars above those in the corresponding week in 1927.

FISHER'S INDEX

Professor Fisher's index of wholesale commodity prices for the week ended Dec. 1 stood at 97.3, which compares with 97.3 the week before and 97.7 two weeks before.

BANK DEBITS

Bank debits to individual accounts outside of New York City for the week ended Nov. 28 were 20 per cent above those in the similar week a year ago.

FEDERAL RESERVE REPORT

Brokers' loans in New York City in the week ended Nov. 28 increased by \$132,768,000, bringing the total up to \$5,289,900. This is the ninth successive week in which a new high for all time has been made. The consolidated statement of the Federal Reserve banks for the week ended Nov. 28 shows an increase of \$190,300,000 in discounted bills and a decrease of \$1,800,000 in holdings of bills bought in the open market.

Timken to Split 4 for 1

NEW YORK, Dec. 5—Timken Roller Bearing Co. at a stockholders' meeting approved a plan for a change in capitalization, involving a four-for-one split of common stock.

Flintermann Convalescent

DETROIT, Dec. 4—C. H. L. Flintermann, president of the Wilcox-Rich Products Co. and president of the Divco Truck Co., is recovering from an operation for appendicitis which he recently underwent.

Compulsory Truck Service by Railroads on Manhattan Island Urged Upon I.C.C.

WASHINGTON, Dec. 1—Compulsory motor truck service by all railroads in the New York area and the establishment of a system of inland stations on Manhattan Island were recommended this week to the Interstate Commerce Commission by Henry C. Ames, an examiner for the commission, who has been making an intensive study of the New York terminal problem. Additional authority from Congress would be necessary to carry out the recommendations and Mr. Ames urges that steps be taken to obtain this suggested legislation.

Though recognizing that railroads have large investments in car floats and pier stations, Mr. Ames held that pier station delivery was inadequate, expensive and unsatisfactory to the public and that it gradually should be abandoned. His recommendations in part follow:

"The commission should strongly urge upon the carriers the establishment of auxiliary trucking service on Manhat-

tan Island to the end that it may ultimately pave the way for discontinuance of the more expensive car-float and pier-station service. The inland station may be operated either by the carriers themselves or by truckmen engaged to do the hauling."

Mr. Ames said that the time may come when store-door delivery will be accepted by carriers and shippers as the logical solution of the terminal problem. But under the present state of the law, he added, this would have to come with carrier cooperation and cannot come with carrier opposition and therefore should be dropped from consideration at this time.

The present so-called constructive station service as now operated on Manhattan Island and the constructive lighterage service developed by railroads in competition for business, could not be approved, Mr. Ames said, because of their tendency to create violations of the Interstate Commerce Commission Act.

Sloan Denies Report of Truck Stock Sale

DETROIT, Dec. 1—That negotiations have been under way between the General Motors Corp. and the Yellow Truck & Coach Mfg. Co. for the acquisition of the entire truck business of General Motors by Yellow, was denied by Alfred P. Sloan, Jr., president of the General Motors Corp.

Mr. Sloan's statement said:

"Notwithstanding that it is contrary to my custom to deal with the numerous rumors that are circulated from time to time concerning the operation of General Motors, in justice to all concerned it appears necessary to take an exception with reference to an article recently appearing to the effect that the negotiations were being carried on between General Motors and the Yellow Truck & Coach Mfg. Co. for the acquisition of the entire truck business of General Motors by Yellow Truck. No such negotiations are pending and no such plan has been considered.

"Furthermore, the continued rumors that Yellow Truck & Coach Mfg. Co. was to engage in the airplane business is also false. No consideration has been given that question, neither is it likely to be."

Liberty Foundry Expands

MILWAUKEE, Dec. 3—Liberty Foundry Co., Inc., Wauwatosa, suburb of Milwaukee, operating also the Spring City Foundry Co., Waukesha, Wis., has purchased the McNally-Tollefson Co., Stoughton, Wis., the transfer being made Nov. 28. All three shops specialize in the production of

internal combustion engine cylinder castings, pistons and other automotive specialties. E. M. Tollefson, president, and R. I. Tollefson, secretary, of the Stoughton company, retire, while J. E. McNally retains an interest and continues as general manager of the foundry.

Durant Nears Completion of New Lansing Factories

DETROIT, Dec. 1—The new \$750,000 body plant at the Durant factory in Lansing will begin production about Dec. 15 and the assembly plant, Jan. 1, according to M. H. Kreiger, factory manager. The body plant will build only passenger car bodies. Truck bodies will be built elsewhere and shipped to Lansing. The assembly plant, however, will build chassis for Durant trucks and the four and six-passenger cars. W. C. Durant, who visited the Lansing plant about 10 days ago, is expected to return shortly and make a definite announcement upon his plans for the Lansing factory.

Cloyes Gear to Move

CLEVELAND, Dec. 1—Cloyes Gear Works, this city, will remove to its new plant this month, where it will have about four times the manufacturing capacity of the present plant. The line has been increased to include all replacement timing gears for passenger cars, trucks and buses.

G.E. Lowers Lamp Prices

SCHENECTADY, Dec. 1—President Gerard Swope of the General Electric Co. announced today a further reduction in the prices of popular type auto-

mobile and flashlight lamps. This reduction averages 8 per cent on the types affected. This price reduction on miniature lamps is the tenth since 1920. Today's prices of Mazda miniature lamps are 52 per cent under the 1914 prices.

Rich Tool to Consolidate With Wilcox Rich Corp.

DETROIT, Dec. 1—Directors of Rich Tool Co., this city, have voted to consolidate with the Wilcox-Rich Corp. subject to approval of the stockholders at a meeting to be held late in December. The plan calls for a share for share exchange of the class "A" and class "B" stocks of the two companies in the new consolidated company. This action was taken after the declaration of a cash dividend of \$2 per share on the Rich Tool class "B" stock, payable Dec. 15 to holders of record Dec. 10.

Directors of Wilcox-Rich Corp. have already approved the consolidation subject to approval of stockholders at a meeting to be held Dec. 28, 1928. C. H. L. Flintermann, president of the Wilcox-Rich Corp., will be president of the consolidated company, and David A. Crawford, president of Rich Tool Co., will be chairman of the board.

Douglas Aircraft Enters Commercial Plane Field

NEW YORK, Dec. 3—Douglas Aircraft Co., Inc., has been formed to acquire the business and assets of the Douglas Co. and the business will be expanded to include the manufacture of commercial planes. The capital will consist of 1,000,000 shares of no par capital stock of which 300,000 shares are to be issued, part to acquire the present company. The new company will begin operations with a working capital of nearly \$2,000,000. There will be no change in management.

Peerless Plans \$1,300 Six

CLEVELAND, Dec. 1—With inventory out of the way and assembly lines rearranged, Peerless Motor Car Corp. is putting the finishing touches on its models to be announced at the New York show. Chief among these is said to be a six-cylinder model that will sell at a price under \$1,300.

Duesenberg Has 102 Orders

CHICAGO, Dec. 3—Duesenberg, Inc., subsidiary of Auburn Automobile Co., has received orders for 102 of the new 265 hp. cars being shown for the first time at the New York Salon, H. D. Ames, sales manager has announced. The company expects to build only 300 cars of this model during 1929.

Washington Sales Gain 2027

SEATTLE, Dec. 3—A recent compilation of sales in the State of Washington for the first nine months of this year shows 31,616 cars sold, as against 29,589 during 1927, an advance of 2027 units.

Production Continues Steady in December

Factory Executives Find Retail Market Devoid of Depression Areas

DETROIT, Dec. 3—Retail demand for automobiles still continues stronger than at the corresponding period a year ago, according to a majority of factory sales executives. The most gratifying condition, sales executives find, is the absence of serious black spots. As a general thing sales are very evenly distributed throughout the country. Production is continuing on a steady basis.

How December production will compare with November is difficult to determine at this date due to the fact that many manufacturers are engaged in rearranging production facilities for the introduction of new models. It is certain, however, that December output will be considerably ahead of the corresponding month last year. This is almost certain with Ford back in production on a big scale and also with Chevrolet and several other makers getting under way on a substantial scale with new models.

Packard Motor Car Co. shipped 4600 in November against 5802 in October and 4372 in November, 1927.

Graham-Paige continues to shatter previous production records, the factory reports. November output totaled 2793 units, a gain of 35 per cent over the corresponding month last year. Graham-Paige production for the first 11 months totaled 73,194 units compared with 20,860 in the corresponding period of last year.

Reo Motor Car Co. enjoyed the biggest November in its history, shipping 2711 units. The best previous Reo mark was enjoyed in November, 1924, with 2606 shipments. The company shipped 2404 in November, 1927. Indications are that Reo production in December will run substantially ahead of December, 1927, and company officials expect total production for 1928 to exceed 1927, the Reo record year.

Tracy Sees Large Winter Sale

There is every indication that large demand for automobiles will continue throughout the winter months, said W. R. Tracy, vice-president in charge of sales of Oakland Motor Car Co. Mr. Tracy said that production of Oakland cars in November set a new record for that month. The company is now in the process of introducing new and larger Pontiac models.

Buick Motor Co. shipments in November approximated 16,000, comparing with 28,614, the record output in October, and with about the same number (16,000) in November, last year.

Reo Motor Car Co. shipped 2711 cars in November, the largest for any November in the company's history, and comparing with 2404 in November, last year. Production has just been

PRODUCTION

	Nov.	Oct.
Buick	*16,000	28,614
Graham-Paige ...	2,793	4,921
Packard ...	4,600	5,802
Hupp	3,114	4,129
Reo	2,711	*2,800
Cadillac	*3,000	5,022
Olds	*4,600	*7,000

* Approximate

started on the company's new moderate priced passenger car. R. H. Scott, president, said December shipments would probably run substantially ahead of December last year, and that the total for the year would slightly exceed the 1927 total.

Olds Motor Works shipped 84,638 cars in the first 11 months this year as against 54,261 in the corresponding period last year, an increase of 56 per cent. December schedule is for 6000. Of the 11 months' total, 6702 cars were shipped abroad against 6164 in the same period last year.

Cadillac and LaSalle Shipments Increase 35%

DETROIT, Dec. 3—According to Lawrence P. Fisher, president of the Cadillac Motor Car Co., shipments of Cadillac and LaSalle cars since the announcement of new models in August have exceeded 18,000 units. This is 35 per cent larger than shipments during similar period in 1927.

"The new LaSalle," Mr. Fisher states, "has shown an 87 per cent increase in volume over the same period of 1927. Fleetwood custom body business has shown a decided increase over the four months' period in 1927, which amounts to 30 per cent. Export business has shown a 25 per cent increase over business for a comparable period of last year. Retail deliveries of all lines have shown a 25 per cent increase over a similar period in 1927.

"Indications are that December will exceed December, 1927, and business for the year 1928 will show a decided increase over previous years. We look forward to 1929 as being a very prosperous year for manufacturers of quality cars," Mr. Fisher said.

Packard Adds to Unit

DETROIT, Dec. 3—The Packard Motor Car Co. is adding two floors to building No. 21. Packard's factory program, besides involving the expenditure of nearly \$10,000,000 a year for new machinery and equipment and rearrangement of many departments for more advantageous use of factory space available, has included just recently a big addition to the stamping factory, a new aluminum foundry building and an almost complete rebuilding of the entire factory powerplant.

Prosperity Highest, Coolidge Declares

Refers to Inter-American Highway and Commercial Aeronautics in Message

WASHINGTON, Dec. 4—Characterizing conditions throughout the United States, at the present time, as the most prosperous the country has ever enjoyed, President Coolidge today delivered his annual message to Congress. The nation's income, he pointed out, is more than \$90,000,000,000, of which \$9,000,000,000 is foreign trade.

From the standpoint of the automobile industry, aside from sharing largely in the nation's prosperity, the President makes two observations of interest. One of these is the Inter-American Highway, the message recommending that this country cooperate with Latin and South American countries in the construction of their highway building programs, by furnishing technical engineers, versed in highway and bridge construction, to such nations as might ask aid. By applying the experiences that this country has obtained in its highway construction program, the President points out that it will enable the southern countries to build their highways faster and more economically.

On the subject of commercial aeronautics the President declares that progress has been most gratifying. Demand for airplanes and engines, he states, has taxed both the industry and the licensing and inspection service of the Department of Commerce. With the rapid growth of air mail, express and passenger service, this new transportation medium is daily becoming a more important factor in commerce, his message declares. "The credit for the achievements during the past 25 years in the field of aviation," he declares, "belongs to a citizen of our own country—Orville Wright."

Ford Adds Equipment Items

DETROIT, Dec. 4—The list of equipment and supplies distributed by Ford Motor Co. to its dealers now includes the following: Well fenders, \$8.25 each; fittings extra; windshield wings, \$8.50; top boot, \$7; nickel and body polishes; spare wheel and tire lock, \$3; spare wheel lock for well-fender equipped car, \$2.50; radiator cap with Junior Motor, \$5; tire gage, \$1.50; spring covers, \$4.25.

Barber-Colman Names Agents

ROCKFORD, ILL., Dec. 3—Barber-Colman Co. has appointed the Rosenfelder Machinery Co., Houston, as agents in the Texas territory; J. R. Walraven, Atlanta, agent in the Georgia territory; Lloyd & Arms, Inc., Philadelphia agent for its hobbing machine and hob sharpening machines, and W. M. Oplinger, Philadelphia agent for its milling cutters and hobs.

Men of the Industry and What They Are Doing

Ainsworth Says U.S. Cars Meet European Standards

H. M. Ainsworth, director general of Automobiles Hotchkiss, who has just complete a three weeks' trip throughout the United States, left Nov. 30 on the S. S. Paris to return to Paris. Before leaving he expressed himself as much impressed with the development of longer and lower styles in coach work now adopted in this market which are in keeping with the requirements of the European market.

"The American producer," he said, "has the advantage of having at his hand an extensive home market for his product, and the buyer is encouraged by the low cost of fuel and the freedom from the heavy horsepower and luxury taxes prevalent in some of our countries."

Chrysler Promotes Sales Officials

The promotion of two sales executives by the Chrysler Corp. of Canada, Ltd., is announced. John C. McGuire and A. J. Shaw are each appointed to the position of director of sales. Mr. McGuire will have jurisdiction over the territory extending from Sault Ste. Marie east to the Atlantic, while Mr. Shaw will assume complete supervision over that part of the Dominion from Port Arthur west to the Pacific.

Reichel Joins Jordan

Jordan Motor Car Co. has appointed R. C. Reichel as assistant sales manager. Mr. Reichel recently was with the Falcon Motors Corp. and formerly he was service manager for Chrysler Corp. and was with the Buick Motor Co. for a number of years.

Erskine on Utilities Board

A. R. Erskine, president of the Studebaker Corp. of America, has been elected a director of Electric Household Utilities Corp. of Chicago. The company, which is controlled by General Electric, manufactures electric washing machines, vacuum cleaners and electric ironers.

Young Named Sales Head

Charles S. Young has been appointed general sales manager of Protex-A-Motor Mfg. Co., Pittston, Pa., succeeding to the post after serving two years as eastern district manager.

Tiedemann to Visit Shows

E. J. Tiedemann, general manager of the Melbourne Motor Body Co., Melbourne, Australia, will attend the New York and Chicago automobile shows.

Chrysler Postum Director

Walter P. Chrysler, president and chairman of the Chrysler Corp., has been elected a director of the Postum Company, Inc.



Adds New Duties

R. L. Wilkinson, vice-president and sales manager of the Klaxon Co., now also assistant sales manager of Delco-Remy Corp.

Chain Belt Promotes Marshall

W. B. Marshall has been appointed sales manager of the contract engineering department of the Chain Belt Co. He has been associated with the company since 1921, when he was graduated from the Sheffield Scientific School of Yale University. He entered its employ as a student apprentice and after several years' work in the shops and foundries he was made secretary to the general manager and later spent some time in the Chicago office. In 1926 he returned to Milwaukee and was engaged in contract engineering sales work until his recent appointment.

Spinks Rejoins Gardner

George D. Spinks has been appointed manager of the parts and service division of Gardner Motor Co., Inc. Mr. Spinks is rejoining Gardner after an absence of two years, having previously been manager of the parts department of the plant.

Behr With Boston Company

Harrison J. Behr, formerly associated with the Mechanical Rubber Co. of Cleveland, has joined the sales organization of the Boston Woven Hose & Rubber Co., as a special field representative.

Despard Succeeds Griffin

Victor R. Despard has succeeded John F. Griffin as secretary and treasurer of the Fibroc Insulation Co., Valparaiso, Ind.

G.M. Export Executives Visit Corporation Units

Export executives of General Motors Corp. during the week of Dec. 3 paid their annual visit to the plants of the corporation in Detroit, Flint, Lansing and Oshawa, Can. They will visit the plants of Cadillac and LaSalle, Chevrolet, Buick, Oakland and Pontiac, Oldsmobile, General Motors of Canada, Ltd., and the General Motors Proving Ground at Milford, Mich.

J. D. Mooney, vice-president of General Motors Corp. in charge of overseas operation and president of General Motors Export Co., will head this delegation and will be accompanied by L. M. Rumely and W. T. Whalen, general managers; E. W. Smith, assistant to the president; Harry Tipper, general sales manager; M. F. Lawrence, general manufacturing manager; R. Staudinger, general finance manager; William Harvey, Jr., general supply manager; F. K. Brun, assistant general supply manager, and W. D. Sullivan, managing director of the General Motors Export Co.

Export Officials Sail

Frederick Pawson, service manager of General Motors Brazil, is returning to Sao Paulo via Europe. Mr. Pawson will visit General Motors assembly plants in London, Berlin, Antwerp and Copenhagen and will sail for South America from Southampton.

Hector Lazo, of the advertising division of General Motors Export Co., arrived Dec. 2 from Honolulu, where he has been acting advertising manager for the last six months.

The last two members of General Motors European automotive committee left America Dec. 8. Luciano Castro of General Motors Peninsular, Madrid, will sail on S. S. Conte Biancamano and Henry Kohler of General Motors International, Copenhagen, will sail on S. S. Frederick VIII.

Oakland Promotes Blackburn

Leonard A. Blackburn, for the last year resident engineer of the Oakland Motor Car Co., has become special engineer in the production department, and A. M. Gault, formerly Mr. Blackburn's assistant, becomes resident engineer.

Highway Research Meeting

WASHINGTON, Dec. 6—The eighth annual meeting of the Highway Research Council and the National Research Board will be held Dec. 13 and 14 at the National Academy of Science, according to announcement by Roy W. Crum, director. Committee reports on the study of road construction problems will be presented and discussed.

C. C. Coddington Dies on Hunting Ranges

N.A.D.A. President Succumbs to Heart Disease Near North Carolina Home

CHARLOTTE, N. C., Dec. 3—C. C. Coddington, aged 50, one of the 12 original Buick distributors, died last night on his yacht near Harbor Island off the North Carolina coast, according to a report received today at his home here. He and a party of automobile distributors were on a duck-hunting expedition when a heart attack caused his sudden death.

Mr. Coddington was president of the National Automobile Dealers Association and president of C. C. Coddington, Inc., of this city, one of the South's largest automobile distributing concerns. He was born in Woodbridge, N. J., and established himself in the automobile business here in 1909. His judgment was highly regarded by the executives of the General Motors Corp., and only a week ago he returned from New York, where he visited President A. P. Sloan, Jr.

Though he always endeavored to avoid public notice, Mr. Coddington devoted a considerable part of his large wealth to civic enterprises here, and the two outstanding ones to which he contributed great amounts were the now defunct \$500,000 speedway and the radio station ABT financed by him through the prosperity of this community in which he invested more than \$200,000 of his personal funds. In his early life he walked the streets of New York almost without funds to pay living expenses.

Members of Mr. Coddington's party at the time of his death included C. L. Whiting of Rochester, N. Y., A. G. Southworth of New York, A. R. Carwin of Brooklyn, Frank McEwen, executive of the Carolina, Clinchfield & Ohio Railroad. Mrs. Coddington died suddenly here in 1925. Three sons are the surviving members of Mr. Coddington's family. The body was brought here for the funeral services.

Horning Named Director of Fuller & Johnson Co.

MILWAUKEE, Dec. 3—Purchase of control of the Fuller & Johnson Mfg. Co., Madison, Wis., by the Second Ward Securities Co. and the Quarles Co., associated investment houses of Milwaukee, is effecting a close affiliation between the Madison company and the Waukesha Motor Co., it is stated. The Fuller & Johnson company for some time past has worked under license from the Waukesha concern in the use of the Ricardo high-turbulence cylinder head in manufacturing a line of farm engines for domestic and export trade and the more recent development of light industrial gasoline, kerosene and oil engines up to 20 hp.

The Fuller & Johnson industrial line, which is to be greatly enlarged in production, will supplement the Waukesha line. The Madison company had its beginnings in 1840. It is valued at \$1,000,000. Its new capitalization will consist of 66,000 common shares without par value, and a bond issue of \$290,000. C. L. McMullen, president, continues with the company. The new board also will include S. A. Perkins, chairman, and H. L. Horning, president and chief engineer of the Waukesha Motor Co., and representatives of the investment houses.

Technical Advisers Named for Aeronautics Meeting

WASHINGTON, Dec. 6—Twenty-nine technical advisers have been named to assist the U. S. delegation at the International Civil Aeronautics Conference to be held here Dec. 12, 13 and 14. In the list announced by the Secretary of Commerce the following names are included: William E. Boeing, of the Boeing Air Transport, Inc.; Harris M. Hanshue, president of the Western Air Express and of the American Air Transport Association of Los Angeles; Paul Henderson, vice-president of the Transcontinental Air Transport of Washington; Jerome C. Hunsaker of the Good-year Tire & Rubber Co.; Clement M. Keys, president of the Curtiss Aeroplane Co.; Charles L. Lawrance, president of Wright Aeronautic Corp.; Rover F. Pitcairn of Philadelphia; Fred B. Rentschler, president of Pratt & Whitney Aircraft Co.; William B. Stout, general manager of the Stout Metal Aeroplane Co., and J. F. Trippe, president of Pan-American Airways.

Crude Rubber Shipments Show Big November Rise

NEW YORK, Dec. 3—Shipments of crude rubber from Malaya during the first three weeks of November amounted to 36,000 tons, exceeding by 22,900 tons average shipments for the first three weeks of the past 10 months, according to Department of Commerce figures quoted by F. R. Henderson Corp. in its weekly market letter. Probably as a result of this large shipment following upon the removal of restriction the rubber market in New York closed heavy last week with prices barely steady.

Stocks in London were decreased to 18,724 tons. It is estimated that arrivals in all ports of the United States during November would be 32,100 tons.

Consumption during November is estimated at between 36,000 and 37,000 tons with a gradual falling off during December.

Dedicate Towne Building

STAMFORD, CONN., Dec. 3—Yale & Towne Mfg. Co., has dedicated the Towne Service Building which will be devoted to the uses of employees. Funds for the building and its maintenance were provided through a special bequest in the will of Henry R. Towne, late chairman of the board.

Financial Notes

Bohn Aluminum & Brass Mfg. Co. has reported for the nine months ending Sept. 30 net profits of \$2,472,087 after all charges. This is equivalent to \$7.06 a share on \$350,000 shares no par capital stock and compares with a net of \$879,083 or \$2.51 on 349,136 shares for the first nine months of 1927. Net profits for the September quarter were \$827,998 or \$2.37 a share as compared with \$276,083 or 79 cents a share during the same period last year. Sales for the first three quarters were \$25,593,471 as compared with \$12,465,915 for the entire year 1927.

Mengel Co., Louisville manufacturer of automotive wood parts, has announced that directors have voted in favor of increasing the number of shares of common stock from 360,000 to 400,000. There are now outstanding 240,000 shares. A meeting of stockholders has been called for Dec. 17, to approve of the increase, the money to be used in taking care of large capacity increase now underway, in connection with the Willys-Overland parts contract taken some months ago. It is planned to permit present stockholders to take the new stock on the basis of one share to three shares held, and at \$25 a share.

Seiberling Rubber Co. for the year ended Oct. 31 shows net profit of \$511,968 after all charges and Federal taxes, equivalent to \$1.69 a share on common stock. Earnings include \$108,185 excess over declared value on shares of no-par common capital stock issued in exchange for three-year 5½ per cent gold notes surrendered and canceled. The fiscal year has been changed to end Oct. 31 instead of Dec. 31. The previous report covered 10 months ended Oct. 31, 1927, and showed net income of \$1,016,068 or \$4.36 a share on 218,857 common shares.

Dennis Bros. report and balance sheet, for the year ended Sept. 30 last, one of the foremost British truck manufacturing companies, shows a net profit of £360,839 on a capital liability of £75,123; the profit compares with £335,684 in 1926-7 and £293,070 in 1925-6. A final dividend of 2s.6d. on each 1s.0d. share will be paid, making, with the interim dividend already paid, 3s.2d. for the year, or 316 2/3 per cent.

Peerless Motor Car Corp. and subsidiaries report net loss of \$339,677 for the quarter ended Sept. 30 after depreciation, taxes and other charges, comparing with net loss of \$403,994 in the preceding quarter and with net income of \$102,205 in the third quarter last year. Net loss for the nine months of 1928 totaled \$937,205, comparing with net income of \$180,713 in the same period last year.

Marmon Motor Car Co. has called a stockholder meeting for Dec. 27 to vote an increase in common stock to 400,000 no-par shares from 200,000 now authorized and outstanding. Stockholders will be offered rights to subscribe to 60,000 additional shares at \$55 in the ratio of three shares to every ten held. Proceeds will be used for expansion and for additional working capital.

Bendix Corp. has declared initial quarterly dividend of 50 cents on common stock payable Jan. 1 to holders of record Dec. 15.

Steel Mills Report First Quarter Sales

Body and Fender Stock in Good Demand—Sheet Tonnages Light

NEW YORK, Dec. 6—A slightly easier tone is in evidence in the steel market, resulting chiefly from the fact that hot-rolled bar mills did not announce any advance for first quarter 1929, continuing the 1.90 cents, Pittsburgh, price in force for the time being, with small tonnages commanding 2.00 cents. While it was apparently deemed inopportune to complicate the situation at this time by lifting the price to a higher level, whereby the placing of first quarter business might have been considerably delayed, efforts to place the market on a 2.00 cents minimum basis at some later date have not been abandoned.

With the price for hot-rolled bars settled, the 2.20 cents level for cold-finished bars continues, and some first quarter business has been booked on that basis. First quarter body and fender stock is in good demand. Blue annealed and black sheets for first quarter are moving in relatively light tonnages at the higher prices recently established. The strip-steel market shows no fresh developments.

With the new base price for automotive alloy steels uniformly established, buyers have nothing to gain by postponing their commitments, and a good flow of orders onto mills' order books is reported.

Bolts and nuts show no change, the market presenting a routine appearance. While demand from some automotive consumers is tapering off in preparation for the annual stock-taking period, others continue to take on steel in good tonnages.

Aluminum—The market shows no change in any of its departments. Demand is seasonally quiet.

Copper—Domestic demand is rather quiet at 16 to 16½ cents. Casting copper is held at 15½ cents, refinery. Fair demand for automotive brasses is reported.

Tin—The opening price on the National Metal Exchange on a contract for December tin was 53½ cents, denoting an advance of ½ cent over the previous close in the open market. The New York Metal Exchange ceased operations simultaneously with the opening of trading on the National. Deliveries of tin in the United States last month totaled 7145 tons, compared with 6475 tons in October, indicating that the year's total deliveries will be approximately 5 per cent in excess of those of 1927.

Lead—The market is stronger, chiefly because of sharp advances abroad. The domestic demand, however, has greatly improved as well.

Zinc—Buyers, apparently recognizing that zinc is cheap at present prices, have bought heavily, resulting in an advance to 6.70 cents, New York. It is rumored that Amer-

Factory and Dealer Events Scheduled for National Show Weeks

NEW YORK SHOW

Jan. 5	Studebaker Corp.	Dinner	7.00 P. M.	Commodore
Jan. 5-12	Hupp Motor Car Co.	Luncheons	12.45 P. M.	Commodore
Jan. 5-12	Locomobile Co.	Meetings	2.00 P. M.	Commodore
Jan. 7	Oakland Motor Co.	Dinner	6.30 P. M.	Penna.
Jan. 7	Rubber Association	Meeting	10.30 P. M.	Commodore
Jan. 7	Rubber Association	Dinner	7.00 P. M.	Commodore
Jan. 7	Amer. Auto. Assoc.	Meeting		Waldorf
Jan. 7	Nat'l Automobile Dealers Assoc.	Convention		Commodore
Jan. 7-8	Packard Motor Co.	Meetings		Roosevelt
	(Exclusively for Packard Distributors)			
Jan. 8	Auburn Auto. Co.	Luncheon	1.00 P. M.	Commodore
Jan. 9	Reo Motor Car Co.	Dinner		Hotel Astor
Jan. 9	Chrysler Sales	Luncheon	12.30 P. M.	Commodore
Jan. 9	Warren-Nash Motors	Luncheon	12.30 P. M.	Penna.
Jan. 9	Automotive Elec. Association	Meeting	10.00 A. M.	Hotel Astor
Jan. 9	Peerless Motor	Dinner	6.30 P. M.	Commodore
Jan. 9	Gardner Motor Co.	Luncheon	1.00 P. M.	Belmont
Jan. 10	Willys-Overland	Dinner	7.00 P. M.	Commodore
	(Admittance is by card only)			
Jan. 11	Chevrolet	Meeting	1.30 P. M.	Mecca Temple
Jan. 11	Chevrolet	Banquet	6.30 P. M.	Mecca Temple

CHICAGO SHOW

Jan. 25	Chicago Auto Trade Association	Dinner	6.30 P. M.	Palmer House
Jan 26- Feb. 2	Locomobile Co.	Meeting	2.00 P. M.	Blackstone
Jan 26- Feb. 2	Hupp Motor Co.	Luncheons	12.45 P. M.	Stevens Hotel
Jan. 28	Studebaker	Dinner	7.00 P. M.	Palmer House
Jan. 29	Oakland	Dinner	6.30 P. M.	Palmer House
Jan. 29	Auburn	Luncheon	1.00 P. M.	Stevens
Jan. 29-30	Auto. Elec. Assoc.	Meeting	10.00 A. M.	Stevens
Jan. 30	Chrysler	Luncheon	12.30 P. M.	Congress
Jan. 30	Peerless	Dinner	6.30 P. M.	Congress
Jan. 30	Willys-Overland	Dinner	7.00 P. M.	Palmer House
	(Admittance by card only)			
Jan. 31	Reo	Dinner		Congress
Feb. 1	Chevrolet	Meeting	1.30 P. M.	Majestic Theatre
Feb. 1	Chevrolet	Banquet	6.30 P. M.	Palmer House
Jan. 28-29	Nat'l Automobile Dealers Assoc.	Convention		Palmer House
Jan. 28-29	Packard Motor Co.	Meetings		Blackstone
	(Exclusively for Packard Distributors)			
Jan. 29	Nat'l Automobile Dealers Assoc.	Banquet		Palmer House
Jan. 30	Gardner Motor Co.	Luncheon	1.00 P. M.	Blackstone.

ican producers have reached an agreement with the European Cartel regarding foreign markets.

Kissel Exports Double '27

HARTFORD, WIS., Dec. 3—Kissel export sales for the first 11 months this year exceed those of last year by exactly 100 per cent. During the year Kissel has made a concentrated effort to build up its foreign business and has been very successful, now having representation in all the leading South American, European and Canadian countries.

Gardner Shipments Gain

ST. LOUIS, Dec. 3—Gardner Motor Co. reports shipments for the quarter ended Nov. 30 amounting to 947 cars compared with 442 for the same period of 1927, an increase of 114 per cent. Shipments for November showed an increase of 15 per cent over November of 1927.

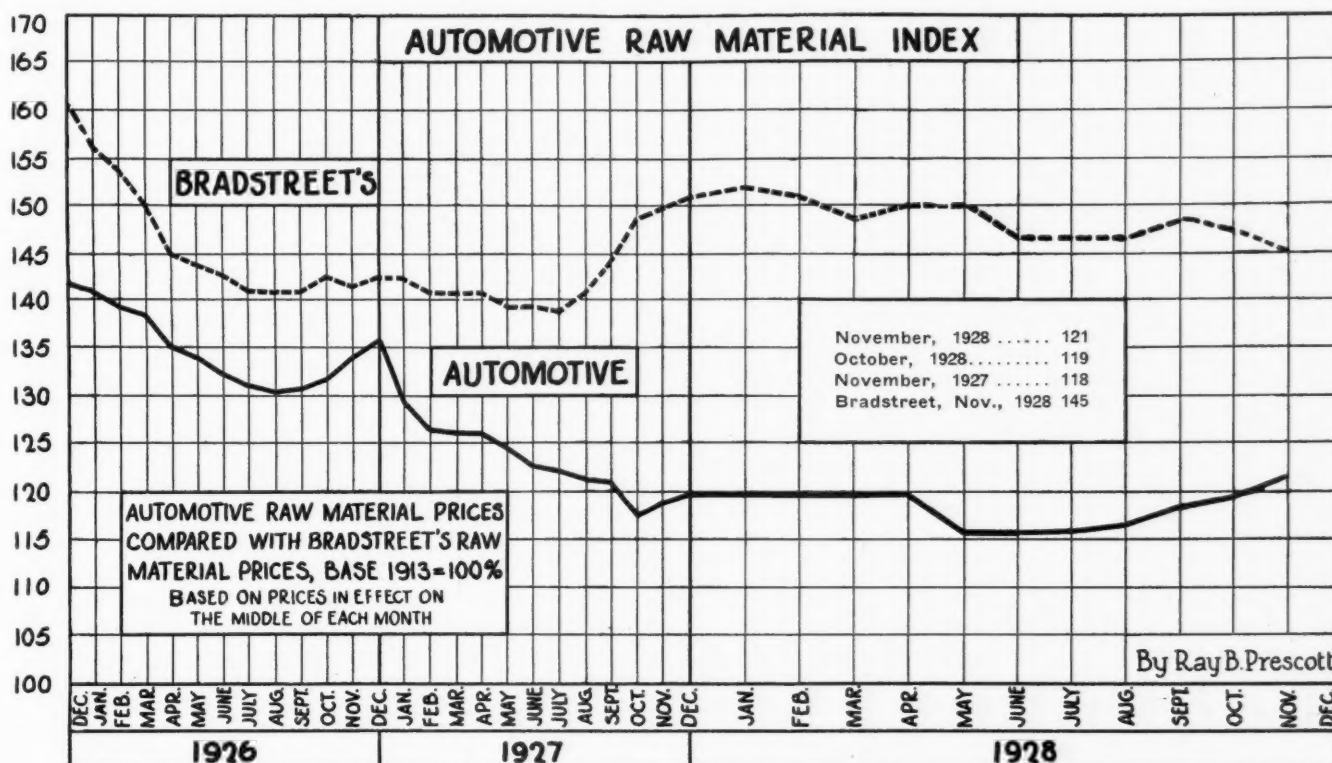
Fourteen Sales Districts in New Auburn Zone Plan

AUBURN, IND., Dec. 4—Auburn Automobile Co. will divide the country into 14 districts under a new zone plan announced at a meeting of district sales managers at the factory late in November. Managers for each of the districts were announced. R. H. Faulkner, vice-president, outlined policies; H. G. Hersh, advertising and sales promotion manager, spoke on the advertising program, and H. L. Brinck, supervisor of district sales managers, gave details of the sales program. N. E. McDarby, manager of sales, was in general charge of the meeting.

Gets Bridge Contract

CLEVELAND, Dec. 1—Gears & Forgings, Inc., has been awarded the contract for furnishing the complete operating trunnion and lock machinery for the Arlington Memorial Bridge.

Raw Material Prices Advance Two Points



Mahoney Resigns as Head of Mahoney-Ryan Corp.

ST. LOUIS, Dec. 1.—B. Frank Mahoney, organizer of the Mahoney-Ryan Aircraft Corp., maker of Col. Lindbergh's "Spirit of St. Louis," has resigned as president of the company. Mr. Mahoney has sold his stock in the company, which is now controlled by a St. Louis syndicate headed by Phil DeC. Ball, owner of the St. Louis "Browns"; Harry H. Knight, broker, and Harold Bixby, chairman of the Chamber of Commerce.

Production of a larger Ryan has been started, the first ship being a six-place cabin monoplane. The company also has under consideration the manufacture of a small, low wing monoplane.

Marmon Adds Coupes

INDIANAPOLIS, Dec. 1.—Marmon Motor Car Co. has added collapsible coupe models to its Series 68 and 78 lines; the first of these is priced at \$1,565 and the second at \$2,065. Rumble seats operated by levers in the driving compartment are provided. Zipper fasteners are used on the side covering and rear quarters for greater snugness and convenience of attachment.

U. S. Cars Gain in India

WASHINGTON, Dec. 1.—Imports and sales of motor vehicles in India continue to exceed expectations, with American cars strengthening their already dominant position, according to cable advices from Calcutta to the Department of Commerce. Heavy stocks

are being carried in the accessory trade but curtailment of further orders is gradually improving the situation.

Rover Airplane Engine Tested in Driggs Model

DETROIT, Dec. 1.—One of the first completed "Rover" airplane engines being built by the Michigan Machine Co. and designed by Harold E. Moorehouse, has been installed in the first of a series of new planes to be produced by the Driggs Aircraft Co. of Lansing. The plane, called the "Skylark," will replace the Driggs' "Dart." It is about 10 per cent larger than the latter, with a wing spread of 28 ft. for the upper and 20 ft. for the lower wing. It is a 2-passenger open cockpit ship. The "Rover" engine is a 4-cylinder-in-line inverted air-cooled type with a 3 3/4 in. bore and 5 in. stroke, giving it a piston displacement of 236 cu. in. Weight complete, less accessories, is 210 lb. Both plane and engine are expected to be in quantity production early next year.

Liberty Offers New Heater

ROCKFORD, ILL., Dec. 1.—The Liberty Foundries Co. a subsidiary of the Burd High Compression Ring Co., has completed a new automobile heater, the Ha Dees, which is being exhibited this week. The heater utilizes hot water from the engine jacket and in summer, by connecting with the radiator fan, provides a cooling system of air circulation through the car. Frank M. White, president of both companies, has been largely instrumental in perfecting the heater.

Stinson Aircraft Builds at New Detroit Airport

DETROIT, Dec. 1.—Stinson Aircraft Corp. will begin construction soon of a new factory which will be erected adjacent to the new Detroit-Wayne Industrial Airport at Wayne, Mich. The building will be of one story construction and will provide 85,000 sq. ft. of floor space. It will be erected on a 10-acre site which will provide for future expansion needs of the company. When completed the company will move its manufacturing operations from Northville.

The newly organized Detroit-Wayne Industrial Airport is being formed by business men of Detroit and Wayne. The purpose is to provide immediately a possible location for aircraft manufacturers or producers of parts or accessories of the aircraft industry as well as to provide facilities for commercial air-service operators.

Unit Gets Willys Order

MILWAUKEE, Dec. 3.—Unit Corp. of America reports an order valued at \$2,500,000 from Willys-Overland, Inc., for the 1929 supply of special four-speed transmissions. The order will be executed by the Fuller transmission division of the Milwaukee company at Kalamazoo, Mich.

Stearns-Knight Prices Cut

PHILADELPHIA, Dec. 3.—Price reductions of \$300 have been made on all series 80 models of the Stearns-Knight line. There is no change in price on the Willys-Knight line.

Ludlum and Atlas Plan Steel Merger

NEW YORK, Dec. 3—Ludlum Steel Co. of Watervliet, N. Y., and Atlas Steel Corp., Dunkirk, N. Y., have called special meetings of their stockholders to vote on consolidation of these two companies. Exact financial details of this consolidation have not yet been worked out but it is expected that all securities of both companies standing ahead of common stocks will be retired.

This consolidation is necessitated, according to H. G. Batcheller, vice-president of the Ludlum company, by the expanding market which his company has found for tool steel, Nitralloy, Silchrome valve steel and in grades of stainless steel which their present production facilities are insufficient to meet. Additional facilities are also needed for the production of the new series of chrome nickel steels manufactured under license agreement with Krupp Nirossta Co.

Further plant expansions are planned by Ludlum for the manufacture of tungsten carbide tools and dies under patent agreements with Krupp and General Electric Co.

Establishes Atlanta Stock

MILWAUKEE, Dec. 1—The Atlanta office of the Cutler-Hammer Mfg. Co. has been moved to 150 Peter St., S. W. The new location provides warehouse facilities and stocks of standard devices will be carried for direct shipment to customers in that territory. A. C. Gibson is manager.

Young Radiator Sales Gain

RACINE, Dec. 1—Young Radiator Co., reports sales in November increase 400 per cent over the same month of 1927. Orders now on the company's books will result in increased operations throughout the next six months.

Stewart Sales Gain 55%

BUFFALO, Dec. 1—Stewart Motor Corp. reports a sales increase of 55 per cent in the first 10 months this year over the same period in 1927. The increase in 1927 over 1926 was 45.7 per cent.

Coming Feature Issue of Chilton Class Jour- nal Publications

Feb. 23—Statistical Issue
Automotive Industries.

Junkers 50-Pass. Plane Planned for Ocean Line

WASHINGTON, Dec. 6—Junkers Airplane Co. in Germany is constructing a giant 50-passenger monoplane of more than 2000 hp. with the aim of placing it in trans-oceanic service, according to word received by the Department of Commerce.

The passengers quarters will be in the wings, which are to be 120 ft. long and more than six feet thick. The wings also contain the plane's four 550 hp. engines, each wing holding two of the engines, which are being adapted to the air-cooled type, although formerly water-cooled.

By means of a special compressor the new plane can fly at almost 20,000 ft. with little loss of power, but the company has announced its intention of trying to increase its ceiling to more than 32,000 ft., and if tests at the new ceiling prove successful, trans-oceanic passenger service will be carried out.

Mexican Sales Fair

WASHINGTON, Dec. 6—Reports on automotive sales in Mexico City received by the Department of Commerce indicate that sales of the low-priced and medium-priced automobiles are fair, while poor season is being encountered in the sale of expensive cars. Sales of accessories are also unsatisfactory.

Sioux City Plans Salvage Yard

SIoux CITY, IA., Dec. 1—Sioux City automobile dealers have agreed upon organization of a cooperative salvage company, which will be incorporated with \$25,000 capital. The company will conduct a salesroom for disposition of old cars, while those unfit for further use will be wrecked and salvaged.

Exports in October Rise to \$50,737,063

WASHINGTON, Dec. 6—Automotive exports during October upset general expectations by establishing a new monthly record of shipments valued at \$50,737,063, the Department of Commerce announces. This was a 72 per cent increase over the corresponding month of 1927, and 49 per cent increase over September of this year.

The month saw shipments valued at \$21,302,138 more than October, 1927, leave the United States, and shipments valued at \$16,574,352 more than September, 1928, go abroad.

Total value of all automotive shipments for the first 10 months of 1928 amounted to \$440,177,392, thereby exceeding the shipments for the entire year of 1927 by more than \$34,000,000. For the 10-month period elapsed in 1928, the monthly average stands at \$44,017,739, as compared with \$34,626,068 for the same period during 1927.

During October, 1928, 29,951 passenger cars were shipped abroad, being 7457 in number and more than \$5,000,000 in value, above the shipments of October, 1927. Truck shipments in October, 1928, totaled 16,573 units, which is a new all-time record for exports in this classification and represents an increase of 105 per cent over October, 1927.

Tractor Exports 53,980

WASHINGTON, Dec. 6—A total of 53,980 wheel tractors, valued at almost \$37,500,000, were exported during the first 10 months of 1928 from the United States, according to the Department of Commerce. Total exports of agricultural implements amounted to \$99,228,000 during this period, of which the wheel tractors comprised 41 per cent of the total.

22,000 Seek Durant Prize

NEW YORK, Dec. 3—Over 22,000 entries have been made for W. C. Durant's \$25,000 prize for the best and most practicable plan to make the Eighteenth Amendment effective. The time limit for submitting plans in this contest expired at midnight December 1.

Calendar of Coming Events

SHOWS

All-American Aircraft Show, Detroit Board of Commerce, Detroit, Apr. 6-14
American Road Builders Association, Inc., Cleveland Auditorium, Jan. 14-18
Amsterdam Automobile Show, Jan. 11-20
Automobile Salon, Inc., Hotel Drake, Chicago, Jan. 26-Feb. 2
Automobile Salon, Inc., Hotel Biltmore, Los Angeles, Feb. 9-16
Automobile Salon, Inc., Palace Hotel, San Francisco, Feb. 23-Mar. 2
Boston, Mass., Mechanics Bldg., March 2-9
*Chicago, National, Coliseum, Jan. 26-Feb. 2
Geneva Automobile Show, Mar. 15-24
Leipzig, Germany, Fair, Mar. 3-13
Melbourne Automobile Show, May 2-11
*New York, National, Grand Central Palace, Jan. 5-12

* Will have special shop equipment exhibit.

Rome Automobile Show, Jan. 30-Feb. 16
Western States Metal and Machinery Exposition, Los Angeles, Jan. 14-18

CONVENTIONS

American Road Builders Ass'n, Inc., Cleveland Auditorium, Jan. 14-18
American Society for Steel Treating, Semi-Annual Meeting, Los Angeles, Jan. 14-18
National Highway Traffic Assoc., New York City, 12 E. 53rd St., Dec. 11-12
Chicago Power Exhibition and Conference, Coliseum, Chicago, Feb. 12-16
International Air Conference, Washington, Dec. 12-14
Manufacturers & Distributors of Motor Truck Equipment, Cleveland, Ohio, Jan. 15

National Automobile Dealers Association, Palmer House, Chicago, Jan. 28-29
National Metal Congress, Los Angeles, Jan. 14-18
National Research Council, Washington, Dec. 13-14

S. A. E. National

Detroit, Book-Cadillac, Jan. 15-18—Annual.
New York, Hotel Astor, Jan. 10—Annual Dinner.

Sectional

Cleveland, Dec. 10
Indiana-Dayton, Dec. 15
New England, Dec. 12
Northern California, Dec. 13
Pennsylvania, Dec. 12

AUTOMOTIVE INDUSTRIES

THE **AUTOMOBILE**

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Established 1902

Vol. 59

No. 24

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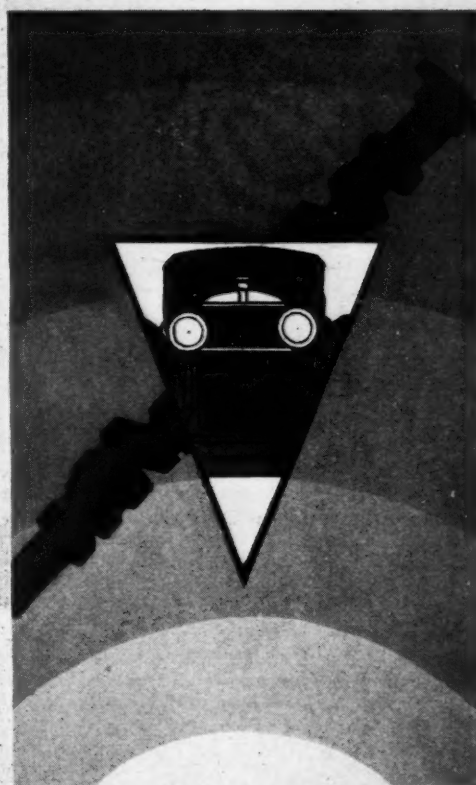
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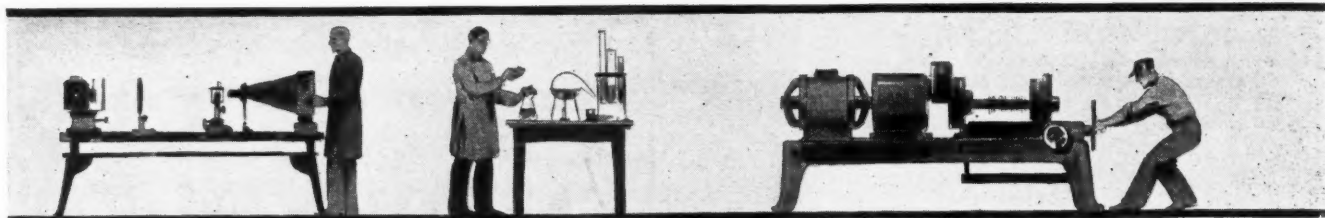
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